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As business men interested in a great industry threatened with destruction we should look to practical business-like methods for safety. It only hurts our interests to antagonize the rest of the world by denouncing all who do not agree with us.

THERE is only one way of improving the market price of any article, namely, by increasing the demand beyond the supply. With silver the demand has not kept pace with the supply and is being reduced by the stoppage of its use as coin by one country after another, while the supply has increased rapidly in recent years.

How can the demand be increased? At anything like the present price of the metal or the cost of producing it in large quantity no outlet can be made for it in the arts. The market must come from its use in money—and no one country can use such a quantity as will absorb the production. We must necessarily secure a general use for the metal, that is, universal bimetallism, or our industry is doomed.

THE only way in which a permanent universal bimetallism can be attained is by international agreement. A flexible ratio which adapts itself to the varying conditions of production can alone prevent such a disproportionate production of the money metals as would ultimately render their free interchangeability impossible.

Put all nations on bimetallism at a ratio to be determined by a permanent monetary clearing-house composed of expert representatives of the nations, and let the money of the world be under the control of this clearing house, as international postal arrangements are now managed by an international clearing-house.

EVERYONE must admit that the money of the world, the foundation of all business transactions, is now managed in a barbarous manner. Every nation has a money and a monetary policy of its own, which is conducted without any regard whatever of its influence on the rights or interests of the rest of the world.

A universal standard and an international supervision and control of the world's money is absolutely necessary to prevent the barbarous experiments which keep the whole business world constantly on the verge of, or actually in, a panic. Surely modern civilization, which has evolved clearing-houses to control and facilitate commercial and postal transactions, can secure a rational control over the money of the world, making it safe, and using it all. A flexible ratio under the control of an international clearing-house, would permit a gradual and rational evolution without disturbance to industry and with vast benefit to every country.

IT is barbarous to destroy the industries and prosperity of two-thirds of the world's inhabitants in blind and stupid monetary experiments, when we have the experience with agencies that can render universal bimetallism absolutely and permanently successful, and that can bring about gradually and without disaster any change which experience may find desirable in the world's money.

AN exhibition of mining and metallurgical appliances is to be held at Santiago in Chile next year, beginning March 15th, 1894. The exhibition is under charge of the Sociedad de Fomento Fabril, and any information in relation to it can be obtained from Señor JULIO PEREZ CANTO, secretary of the society, at Santiago de Chile. It is expected that all the South American countries will be represented, and it will probably be to the advantage of our manufacturers to take part.

THE sharp criticisms of the Reading management which Mr. ISAAC L. RICE has been making are still continued, his chief points of attack recently being the Lehigh Valley lease and the coal purchase system, under which the Reading handles all the coal of the combination. Mr. RICE'S criticisms do not all seem to us judicious, but he is doing the Reading stockholders service in calling their attention to some points in the management, and generally in keeping them awake and watchful.

THE outlook for our silver producers is not at all satisfactory, though the price of the metal has not gone back to the lowest point of a few weeks ago. The change in the tone of the advocates of free coinage in the West is producing a better feeling elsewhere, and there is a better chance for reason and argument. It is, indeed, supreme folly to keep on antagonizing the great majority of our people in advocating what there is not the slightest probability of ever attaining, and which, in our opinion, would be the very worst thing that could happen to the silver producers if it could be attained. The free coinage of silver by this country alone would be pure insanity.

THE capacity of the iron furnaces in blast, as shown by their July statements, is now about 10 per cent. less than in June, a result which had been generally expected from the condition of the iron market. A still further reduction is not improbable, as we hear from time to time of different furnaces going out of blast, generally those which for some reason or other are unfavorably situated. The better placed furnaces seem to quite able to hold their own and to keep going, but those which for

any reason are unable to make pig iron at a low cost have to give way unless they can command some special local market.

In this industry, as in nearly all others, there seems to be a general tendency to reduce wages, though these paid here in the East are already so low as to be scarcely above the actual living expenses of the men.

A NOVELTY in the use of aluminum, recently observed in Germany, was a folding pocket scale, one meter long, which is no heavier than ivory or wood and obviously less fragile. Another novelty is the "aluminum necktie," which is advertised by an enterprising manufacturer. These are made of metal, frosted or otherwise ornamented, in various shapes imitating the ordinary silk or satin article, and are fastened to the collar-button, or by a band around the neck. The manufacturer recommends them for summer-wear, since they can be easily cleaned when soiled, while they are inperceptibly heavier than cotton, cambric or silk. They would seem to be a fitting complement to the celluloid collar. Another manufacturer advertises military helmets of aluminum, which weigh only 500 grams. There is small demand for helmets in America, but the neckties might be introduced—and why not cuffs, collars and shirt-fronts of the same metal?

A GENERAL reduction in wages throughout the country, and especially in the Western mining regions, seems to be the inevitable outcome of the present business depression. It is no secret that this is in contemplation, and it will be well for both the employed and employers to be guided accordingly.

Already the miners on the Comstock who have had for so many years $4 a day, have, it is reported, offered to come down to $3.50, but the probability is that wages throughout the country will be equalized, and if miners can earn only $1.50 or $1.75 a day in Michigan and Minnesota, a rate of $3 or $2.50 in the Rocky Mountain States will probably rule. There is no probability of such a recovery in the price of silver, unless an international agreement can be secured, as will render the old rates of wages again possible.

This painful prospect is confronting our industry, and it can only be compensated for by the steady work which large outputs can give.

THE Congress on Aërial Navigation, which is one of the group of meetings to be held in Chicago next month, will not seem now wholly the visionary affair which it would have been considered a few years ago. The question has of late years interested some men of scientific standing, and the names of Prof. J. W. LANGLEY, OCTAVE CHANUTE and HIRAM S. MAXIM—whose ability respectively as a man of science, an engineer and a practical mechanic, no one can question—will give assurance that the meeting will have some solid facts to discuss and will not be given over to the cranks and impracticables.

The three gentlemen just mentioned, who have all spent much time and thought on the question, belong to the class known as Aviators, who believe in flight by mechanical means, while the older class of balloonists are now chiefly represented by the French and German officers who have been for years engaged in experiments with the balloon for their respective governments, chiefly, of course, with a view to its use in warfare The best, that is the most careful and scientific, work of recent years has been done by the Aviators, and their part in the congress will be the most prominent.

While we do not believe that flight will become a general method of progress, or that the great highways of travel will ever be in the air instead of on the land or the water, yet the present state of the science seems to prove that aërial navigation is among the possibilities of the near future. The great need at present is a light motor which will furnish power enough without overweighting the apparatus. Mr. MAXIM claims to have secured this, provided he is able to substitute aluminum for steel in his boilers without reducing the pressure too much; but his motor is not yet quite ready for practical use. The results so far obtained, however, are quite sufficient to justify further trials.

THE SEVEN STARS MINING COMPANY.

THE "Seven Stars" are still dim and lightless. We, last week, called attention to reports we had received from Arizona which foreshadow a very serious outcome for this enterprise. The directors, as given on the company's prospectus, are Hon. WARNER MILLER, of New York; ARTHUR G. YATES, of Rochester, N. Y.; J. CLIFFORD RICHARDSON, of St. Louis; H. H. WARNER, of Rochester, N. Y.; Hon. J. W. VROOMAN, of Herkimer, N. Y.; B. E. CHASE, of Rochester, N. Y.; Hon. R. S HUDSPETH, of Jersey City; J. HERBERT JEFFERIES, of Philadelphia, and C. B. WISER, of Chicago. We commend to these gentlemen the need of an early investigation and prompt explanation of the affairs of the company.

It appears that the capital of the company was $3,000,000 in 600,000 shares, and that 200,000 of these shares were offered to the public at $5, with a guarantee of quarterly dividends for five years, of 15 per cent. per annum, and an agreement by Mr. Warner to purchase the stock at the expiration of twoyears, if called upon to do so.

It is not necessary to enter into particulars; the greater part of this prospectus was published in the advertising columns of the ENGINEERING AND MINING JOURNAL, October 1st and 8th, 1892. We hear from what we consider entirely reliable sources that the property, which cost, it is said, about $450,000, has not been fully paid for; something like $250,000 is said to be still owing on it, neither have the workmen's wages been paid up. The entire proceeds of the ore extracted went to the vendors, who now threaten to take possession of the property. As the agreement on which the stock was sold stipulated that the stockholders should "participate in the full earnings of the company," this diversion of the proceeds may raise an interesting question.

A considerable amount of ore is on the dump, but it is of a character that has not yet been successfully treated. The cyanide plant, erected at a large expense, has been a complete failure. What will be the position of stockholders if the mine is taken possession of by the vendors? And how far are the directors personally responsible for the statements of the prospectus, are questions which may attract much attention later on.

We have called the attention of the company to the serious statements made by our correspondents and have asked definite information on several points. We have received no reply beyond the formal one that our communication had been laid before the board. We still hope we shall be able to relieve the anxiety of stockholders by some official statement of what the company intends doing. It would be well also if the company should say what became of the proceeds of the sale of the company's stock.

MANUAL TRAINING AND TRADE SCHOOLS.

For several years past there has been much discussion as to the introduction of what is called "manual training" into our school courses, and in many places the experiment has been made, with results depending largely on the good or bad judgment of those who had the matter in charge. The decline and, in many trades, the practical disappearance of the old apprenticeship system and the increasing use of machinery partially automatic in its action have made it more difficult every year for young men to learn a trade. In the machine business, to take one instance, the old-time machinist and millwright have almost disappeared, and in their place have come men who can hardly be called skilled workmen, since their instruction has been limited to running certain tools, and they are helpless when they attempt to pass beyond the narrow limit of their special branch. In many other trades similar conditions prevail.

It was to remedy this state of affairs and to provide a substitute for the apprenticeship system that the manual training plan was first suggested and taken up by ardent advocates. Trade instruction was to be made a part of the school course, and the graduate of the public schools was not only to be versed in the "three R's," but was to have a trade at his or her finger ends. Like all new plans, however, too much was expected of this, and at the present time the reaction seems to have come, and manual training is in danger of being dropped altogether, as it was at first overdone, simply because it has failed to meet too hopeful expectations of enthusiasts.

There can be no question that such training has a place, and an important one, in a school course. The education of the hand and eye is quite as necessary as the training of the mind, if a child is to be properly prepared for the hard and practical work of life. The mistake made was in expecting that a trade in the full sense could be taught in this way, or in any other way than by practical work. The business of an elementary public school is not to half teach its graduates trades, but to turn them out ready to take up their trade instruction intelligently. Just as the ideal training for a mining, a civil or a mechanical engineer is the technical school course followed by hard work as a subordinate in the mine, the field, or the workshop, so the education for a skilled mechanic should be the public school, followed by work at the bench or the lathe. The great difficulty, under present conditions, is to supply the latter part of the course. Not only are workshop arrangements and the modern system of sub-division of labor against it, but in many cases the trades unions have also aided by their unreasonable restrictions in keeping out the boys who are willing to and ought to be at work. The result has been that there is a continual increase in the number of unskilled laborers and of idle and vicious men, while the more ambitious boys have been driven into the already overcrowded ranks of clerks, bookkeepers and other sedentary workers.

The most practical and hopeful attempt to remedy this state of affairs has been that made by the late Col. RICHARD T. AUCHMUTY, of New York, in the establishment of trade schools, where direct practical instruction is given in plumbing, carpentering, plastering, painting, masonry and some other trades. No attempt is made in them to combine theoretical with practical teaching; they are simply workshops where the boy is taught to do his work in the best way, and to prepare himself to meet such contingencies as are likely to arise in his chosen trade. The instruc-

tion is given by skilled mechanics, who have been active workers in their respective trades. From a small beginning, twelve years ago, these schools have grown until over 600 boys are yearly taught. Colonel AUCHMUTY was a public-spirited citizen, and not only gave his time to this work, but also pecuniary support to the full extent of his means, and he is fully entitled to rank with PETER COOPER as a public benefactor in the best and most practical sense.

It is to be hoped that the work which he has so well begun will not be allowed to drop. In his lifetime his plans were opposed by some who regarded him as visionary, and he also met with bitter opposition from the trades-union leaders, which still continues to some extent. Certainly, there is nothing more practical to take the place of his trade schools, and they fully deserve the public support which we hope will be given them.

NEW PUBLICATIONS.

LES MINES, LES MINIERES ET LES CARRIERES. Par A. Badoureau et P. Granglet. Paris France: Librarles Imprimeries Reunies. Illustrated. Pages, 330.

This work on mines, mining and quarrying was especially prepared as a textbook for the students in the series called by the publishers "Bibliotheque des Sciences et de l'Industrie," the authors disclaiming all pretense of having written a treatise. The subject is divided into numerous heads, such as exploration, working, breaking, shafts and galleries, transportation, ventilation, accidents, etc. The opening chapter gives several definitions and a cursory review of French mining law. The book contains numerous illustrations, but these do not show the more recent and improved devices, although it was written during 1892. That part treating of the mechanical preparation of ores gives but a very imperfect idea of the subject, and the methods given are those of years ago. The American rock-breaker, illustrated on page 256, is unlike anything known to us and was probably taken from a patent specification. On the whole it may be said that the book is of no value to the American student unless he is interested historically in old processes and methods. There is no index, and the table of contents is given at the end of the book.

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.

Bird's-eye Views and Guide to Chicago. Chicago and New York: Rand McNally & Co. Pages 300; with map and illustrations.

The Statistician's Report of the Eleventh Census of New South Wales. First Installment. Sydney, N. S. W.; Government Printer. Pages 135.

Ozone: Its Commercial Productions and Its Applications. By Emile Andreoli. London, England; H. Alabaster, Gatehouse & Co. Pamphlet; 86 pages.

The Geology and Mineral Products of Missouri. By Arthur Winslow, State Geologist. St. Louis; Published for the Missouri World's Fair Commission. Pamphlet, 32 pages.

The Mining Industry of Japan, 1867-1892. By Wado Tsunashiro, Director of the Mining Bureau. Tokyo, Japan: Printed at the Tokyo Tsukuji Type Foundry. Pages 304; illustrated.

Bureau of Education: Circular of Information No. 1, 1893. Shorthand Instruction and Practice. By J. E Rockwell. Washington; Government Printing Office. Pages 208; with plates.

Dry Ore Concentration, with Particular Reference to the Pape-Henneberg Process. By Oberbergrath O. Bilharz Magdeburg-Buckau; Issued by Fried. Krupp. Pamphlet, 28 pages; illustrated.

Timber Physics, Part II.; Progress Report. Prepared under direction of B. E. Fernow, Chief of Forestry Division, Department of Agriculture. Washington; Government Printing Office. Pages 103; illustrated.

Standard Steel Construction: A Manual for Architects, Engineers and Contractors. Arranged by J. M. Larimer. Pittsburg, Pa.: Jones & Laughlins, Limited. Pocketbook; 224 pages; illustrated. Price, $2.

United States Geological Survey Monograph XVII. Flora of the Dakota Group XVIII. Gasteropoda and Cephalopoda of the Raritan Clays and Greensand Marls of New Jersey. XX. Geology of the Eureka District. Nevada. Washington; Government Printing Office.

Geological Survey of Texas. 1. *The Artesian Wells of the Gulf Coastal Slope.* By J. A. Singley. 2. *Organic Remains from the Deep Well at Galveston.* by Gilbert D Harris. 3. *Rocks of Trans Pecos Texas.* By A Ossinn. 4. *Trans-Pecos Texas.* By W. H. Streeruwitz. Austin, Tex.: State Printer. Pamphlets; 176 and 120 pages; illustrated.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents

Some Misconception Concerning Asbestos.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In the "Engineering and Mining Journal," pages 250, 268 and 292 of the number for April 1st, attention has been drawn to this subject by Mr. J. T. Donald and Mr. A. L. Chester, but as the matter now stands, any misconceptions therein represented have been in nowise diminished, but rather increased. The misconceptions of which Mr. Donald complains are stated under four headings, and are here referred to in the same order:

1. Whatever misconceptions may exist in a general way with regard to the mineralogical character of asbestos or to the correct application of that name, such misconceptions cannot be held to exist in mineralogy or with mineralogists; all authorities are equally explicit in distinguishing between the two very distinct minerals, namely, amphibole and serpentine, varieties of which are now indiscriminately termed asbestos in every day parlance and local trade usage. I do not wish to imply that the asbestos trade is to be regarded as the cause of these pseudonyms; on the contrary, I believe they are more rational in employing the generic name of "fiber," and that the designation of "Canadian fiber" and "Italian fiber," etc., is far more appropriate than the application of the term asbestos to a typical chrysotile, as is advocated by Mr. Donald.

2. The alleged misconception that Canadian and Italian asbestos are different minerals is, from a mineralogical standpoint, the most important part of the question under discussion, and I must here differ entirely from the opinion held by Mr. Donald. I know that there exists Italian chrysotile, as well as Canadian asbestos proper, and herein, perhaps, lies the explanation of the confusion, and too much care, therefore, cannot be exercised in the selection of all specimens to be employed as representative samples.

3. The misconception as to the effect of heat on the several varieties of these fibrous minerals is one result of the anomaly which Mr. Donald advocates, namely, the application of the name asbestos to the well marked mineral chrysotile. True asbestos having acquired its fire-resisting reputation by experiences obtained with the virtually anhydrous hornblendic mineral, the general public are permitted to expect similar physical properties from an apparently like product bearing one and the same name.

4. "The gravest and most widely spread of the several misconceptions," Mr. Donald concludes, "is that asbestos is possessed of high non-conducting qualities." This may also be partly attributed to the same causes as expressed in section 3 preceding; the practical manufacturer, however, will readily differentiate the physical properties he requires from the various grades of "fibers" or classes of minerals submitted to him for purchase, without recourse to a certificate of chemical analysis.

These, then, are the misconceptions which appear to be only augmented by the light which Mr. Donald endeavors to throw upon them. The chemical qualities and physical properties of the respective amphibole group and serpentine group of asbestiform minerals are well marked and characteristic, affording a positive basis for nomenclature and classification, and allowing no arbitrary liberty as regards its correct mineralogical appellation. Let us by all means conserve the name of asbestos as originally applied to the amphibole variety, and if employed generically the attributes of serpentinous and "hornblendic," or simply serpentine-asbestos and hornblende-asbestos might be adopted. If a chemical analysis shows a product cannot be thus classified, then we are in presence of a new mineral requiring investigation.

J. LAINSON WILLS.

OTTAWA, Canada, May 27, 1893.

Should the Ontario Silver Mining Company Adopt the Leaching Process.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: A pretended answer to my query in your "Journal" of April 15th has appeared in a recent issue, writen by "Also an Ontario Stockholder," to which he should have added "Also a Promoter of the Russell Process," and presumably a stockholder and an expectant participator in the royalties to be paid for use of said process by said company.

He first says that "he need not enter into a tedious reply to all of 'O. S's' arguments and figures, for the reason that they are only ex parte statements." The figures having been taken from the official reports of the Daly Mining Company, no one is convinced, so he deftly starts on another twist. A "curious fact the extraction of silver on Daly ore has been gradually going down." In order to show this the years 1886 and 1887 are taken as a whole, while the years 1888 and 1889 are split and made "first half of years" and "second half of years." Had the years 1886 and 1887 been split like 1888 and 1889, what would they have shown—a steady increase? By such an analysis we would then have five half years of steady increase against a year and a half of decrease. Note also that the latter half of 1888 was higher than the average of 1886 and 1887.

Let me now consider the "necessary statistics." Epitomized they are: 1st. Base ore makes a larger grade bullion. 2d. With hard ore a battery crushes less. 3d. Higher extraction during 1891 and 1892 due to heated solutions. 4th. During 1889 the pans received the pulp from the flue and dust chambers of the Stetefeldt furnace which ran higher in gold than that from the stack of the furnace which was sent to the vats.

The relation of the first two points to milling operations are well understood. The third point, heated solutions, is an important one. With heated solutions the cost of extraction is increased, due to a large increase in chemicals consumed per ton of ore treated, and in addition the cost of heating itself, together with the wear and tear on the heating apparatus and the conduits all about the mill. How much this offsets increased extraction by lixiviation over amalgamation let us now consider. From the Daly Mining Company's reports we find: 1888, amalgamation extraction, 90·7%; milling per ton, $6.40; 1892, lixiviation extraction, 94·3%; milling per ton, $6.98; difference in extraction, 3·6%; in milling cost, 58 cents. Compared with 1891 we find the cost of milling in 1892 to be 71 cents more per ton. Hence we have conclusive proof that heated solutions are costing more as the extraction by them increases. Taking the above saving of 58 cents by amalgamation over lixiviation and adding to it the saving in fuel and labor for the reasons given in my former communication, we get 58 cents + $1.44 = $2.02 to offset an increased extraction of 3·6%. From the Daly report of 1892 we get the value of the ore $30.68 + $1.75 = $32.43. The percentage $2.02 is of $32.43, gives us what the increased saving by lixiviation should be to equal amalgamation conducted as in 1888. This is 6·2%; hence the difference, 2·6%, is in favor of amalgamation. The difference would still be greater if we added the royalty of, say, 50 cents per ton, which I believe is about the average charge by the Rus-

sel Process Company. Another question of importance then arises: Are the tailing samples from the leaching vats as accurately taken and as representative of the loss as the samples from the pans?

The fourth point is the different ore sent to vats and pans in 1889, thus explaining the increased extraction of gold by amalgamation. This I positively deny, basing it on the superintendent's report for 1889, in which he states: "The extraction in both (vats and pans) is probably lower than if all the ore had been treated by either method alone. This is due to the fact that it was impossible to keep the roasted pulp on the cooling floor separated, so that that which could be treated more advantageously by amalgamation could be sent to the pans and that which could be treated better by leaching to the vats."

That a millman could separate his pulp in such a way that a certain portion could be sent to the vats, considering the way it is piled on the cooling floor and afterward pulled about in wetting down, is to me almost impossible, and the above quotation confirms it. I am afraid "C. C." has been imposed upon, and could have better answered my note by a straightforward statement, giving assay value of ore sent to vats and pans.

NEW YORK CITY, June 24th, 1893. ONTARIO STOCKHOLDER.

The Sulphuric Acid Process for Refining Lixiviation Sulphides.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In your issue of June 10th, 1893, Mr. F. P. Dewey makes some statements with regard to the invention of the above process to which I wish to call atention. Mr. Dewey claims that the facts, as presented by Mr. W. S. Morse in his letter of the same issue, do not show who invented the process. Inasmuch as Mr. Morse makes the direct statement that I am the inventor, the statement of Mr. Dewey's is simply a denial, unaccompanied by any proof whatever of the inaccuracy of Mr. Morse's statement. Were the matter to rest at this point, it might simply be a puestion of veracity between Messrs. Dewey and Morse. However, Mr. Morse gives some very interesting dates, the accuracy of which Mr. Dewey does not, and, of course, cannot deny, but instead he kindly enlightens us as to the laws of the Patent Office

Mr. Dewey lays great stress upon two facts which he claims bear upon the question of who really invented this process. These facts, therefore, must be the strongest evidence Mr. Dewey has to prove himself the inventor of the process. They are as follows:

First. "Previous to going to Aspen—that is, previous to August 20th, 1892—our Mr. Walter told E. H. Russell and Mr. Frank Johnson, at Park City, that the process the Aspen people were using belonged to us, and they were infringing our rights."

Second. "When in Aspen Mr. Godshall told our Mr. Walter that he was led up to and guided in devising the process then in use in Aspen by information given him by our Mr. Dewey."

In regard to the first statement I have only to say that I know it to be true, as Mr. Dewey told me when in Aspen that they had been under the impression that we were using the process owned and controlled by them, the particulars of which will be given further on. Mr. E. H. Russell had also informed us that Mr. Dewey was under the impression that we were using the process controlled at that time by Mr. Dewey, so no denial whatever is made of the first statement.

However, as the secret of the Aspen process at the time was known to only a few, including Mr. Frank Johnson and E. H. Russell, the former having witnessed its development from the very beginning by Mr. Morse and myself, it is no wonder that Msssrs. Dewey and Walter then thought we were using their process.

In rgard to the second statement that Mr. Dewey forgets to mention the efforts he made to induce Mr. E. R. Holden, president of the Holden Smelting and Milling Company, to buy the rights of the process at that time controlled by him, and called the "Whitehead Process," the details of which I have not time to enter upon at the present, suffice it to say that the principle of the process is embodied in the following reaction:

$$Ag_2SO_4 + CuS = CuSO_4 + Ag_2S$$

so entirely distinct from the acid process that Mr. Dewey cannot claim any similarity.

In his second statement, where he claims I received my information from him, why does he not publish the letter giving such information to me? I have his letters and can publish them if he requests it, but the first one will show the most minute details of the Whitehead process, the great economy of it, etc., etc. The second asks for information in regard to my investigations on the merits and demerits of the Whitehead process. To show how Mr. Dewey erred in his second statement, I will repeat just what I did say both to him and Mr. Walter, which was, that my investigations of the Whitehead process led me to more thoroughly study the reactions of the sulphides of copper and silver, and in this way I discovered the sulphuric acid process.

The information that led me to the discovery of the process was obtained from "Percy on Gold and Silver." I have not the books with me, so I cannot give the page, but as I remember in the reactions of silver sulphide the following statement is given: "Gmelin states that silver sulphide is soluble in concentrated sulphuric acid." After obtaining this information I endeavored to dissolve out the silver and leave the copper and lead behind, but found at once that the copper was also soluble, but that the sulphides of both copper and silver were soluble only at or above a certain temperature. That is how the process originated.

To Mr. Morse is due much of the preliminary work in making the experiments, and all of the mechanical part belonging to the refinery.

That the process commercially is a failure has been demonstrated at Aspen. However, I have modified the process, as explained before the Colorado Scientific Society, when reading a paper entitled "A Review of the Russell Process," May 1st, 1893, and have every reason to hope that the consumption of acid and other difficulties will be successfully overcome.

L. D. GODSHALL.

Asst. Mangr. Rosebud Mining and Milling Co., Cripple Creek, Colo.

The Pearce and Allen-O'Harra Roasting Furnaces.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I was quite interested in an article on the Pearce turret furnace in your issue of July 3d. It would be folly for anybody to attempt to impeach the experience or ability of Mr. Richard Pearce, and while I do not in any way intend to decry or disparage his invention I would like to say a few words on the subject of the Pearce furnace, as compared with the Allen improved O'Harra furnace. Of late there have been numerous improvements made and suggested in calcining furnaces, but most of them, have taken the nature of mechanically stirred reverberatory furnaces.

To the best of my knowledge but two forms have received any decided recognition in the West, the rectangular, or the real reverberatory type, and the turret, or circular furnace, and any question of superiority is, I believe, between these two. Permit me to call your attention to a fact which I consider an advantage which the O'Harra has over the Pearce. The ore travels equally and is disposed of in like proportions in all parts of it, while it seems to me that in the latter furnace the ore or concentrates on the outer circle would receive naturally more treatment and would travel considerably farther than that on the inner circle. A natural consequence would be that the ore would receive more roasting in proportion, the matter on the outer circle being brought to a higher state of oxidation, while in the O'Harra it is fractionally accurate, as we can testify by five months of continual usage.

Referring to the statistics furnished in the article permit me to give a few facts from my personal experience in the actual supervision of the two Allen improved O'Harra furnaces, built by the Western Iron Works, of Butte, at the Montana Ore Purchasing Company's plant at Meaderville, Mont., as well as the reverberatory hand calciners of two of the largest smelting companies of the same place, by whose courtesy I am enabled to justify my figures. The general estimates made by new inventors on the calcination of sulphide ores are very misleading, as they usually omit some of the most important figures, as, for instance, fuel, labor, etc. They then state that the expense is a certain amount lower than a reverberatory or similar type of furnace, but omit to mention the cost of roasting in any of these furnaces. I believe that the only equitable method of ascertaining the superiority of one machine over another, and the only fair test, is to compare the relative expense of each, reduced to a standard, as, for example, the cost of oxidizing one unit of S to SO_2, or concisely the amount of labor necessary, the cost of fuel for similar results and the amount of sulphur in the ores and calcines treated. The question of repairs and the interest on investment also should be considered.

To show that my estimates are not imaginary, I would state that in December, 1892, there were built under my personal supervision two Allen improved O'Harra furnaces of the following dimensions: Total length, 128 ft., 30 ft. of which is cooling floor; two hearths, 9 ft. each. In the article on the Brown-Allen improved O'Harra in your issue of May 20th you say: "And if the furnace is pushed to its maximum capacity, from 35 to 40 tons of roasted ore, they carry an average of about 6%." Notwithstanding the fact that we have exceeded this capacity by 35%, calcined to a lower percentage of sulphur, for the sake of argument we will take your figures as a hypothesis. The detailed expenses of a hand calciner for 24 hours are as follows: Four spaders, at $3.50 each, $14; ⅓ feeder, at $3, $1; 4.1 cords of wood, at $4.50, $18.45; total, $33.45. Ten and one-half tons calcined, 8% S., cost per ton calcined, $3.18.

Now, I will take the work and expense of two O'Harra furnaces for 12 hours: One feeder, at $3, $3; one fireman, at $4, $4; two wheelers, at $3.50, $7; 3·6 cords wood, at $4.50, $16.20; repairs, etc., $1; total, $31.20; tons calcined, 40; cost per ton, 78 cents. As a matter of fact, the cost of calcining is 62 cents per ton in our O'Harra's.

Referring again to your article, in view of the fact that its author has left us in the dark as to the expense at Argo, my argument must necessarily be based on the expense at Butte. He says: "The cost of roasting at Argo shows a saving of $1 per ton compared with the reverberatory, and the saving between the Pearce turret and the Brown-Allen O'Harra is one-third in favor of the former;" so if the cost of a Pearce turret is $1 per ton less than a reverberatory, as a natural consequence the cost of a Pearce turret in Butte would be $2.18, while the Allen improved O'Harra cost per ton calcined would be 78 cents, making a slight difference of $1.40 per ton. When only working 40 tons per 24 hours to each furnace our calcines run from 3 to 4% S., but at times when we were short of calcines we have put through 58 tons to each furnace and then the calcines ran up to 6% S., but never higher. Our raw ore fed runs from 40 to 45% S.

BUTTE MONT., June 10, 1893. H. C. BELLINGER.

Assay of Low Grade Tin Ore.—The fire assay of an impure tin ore is known to be extremely inaccurate, duplicate assays of ores carrying as high as 15 or 20% tin with a gangue composed of quartz, iron, and other impurities, often giving widely varying results. In the "School of Mines Quarterly," Mr. Robert Peele, Jr., gives the following method of concentration and assay used by him in Bolivia. The ores operated upon were: 1, gray cassiterite, intimately associated with quartz and iron, the percentage of tin varying from 1 to 15%; 2, iron pyrites carrying from 2 to 5% tin. This was roasted and treated the same as the oxidized ores. The samples taken, from 50 to 200 grammes, were ground to pass through a 60-mesh sieve, and carefully washed or concentrated in a gold pan or "horn spoon." The residue was then dried and reground as fine as possible, after which it was treated with a mixture of one-fourth nitric and three-fourths hydrochloric acid. A gentle heat is applied with frequent stirring, and the whole evaporated, till the mixture thickens and begins to stick to the bottom of the vessel. Add water, and run off the fine disintegrated portion of the ore into a beaker. Allow contents of the beaker to settle a few moments and decant carefully, after which return residue to residue 1, and repeat treatment with acid. This may be done several times. The final residue will consist of oxide of tin and silica, which may be separated by washing in a botea or conical dish. The oxide of tin is then dried and a fire assay made, using potassium cyanide as flux.

THE ESTIMATION OF GOLD AND SILVER IN ANTIMONY AND BISMUTH.*

By Ernest A. Smith, A. R. S. M.

Most of the ores of antimony and bismuth contain larger or smaller quantities of gold and silver, and these metals as they come on the market contain certain amounts of these valuable impurities. It is, therefore, interesting to determine how much gold and silver is left in the antimony and bismuth of commerce. The usual methods for estimating the gold and silver in antimony are scorification and solution methods. Scorification cannot be recommended for the present purpose, as a very large amount of lead is necessary to ensure the elimination of the whole of the antimony. Wet methods are not satisfactory on account of the very small percentage of gold and silver contained in the antimony. After some research we have discovered a better process and I give an account of it and its results herewith. Five hundred grains of the antimony are crushed to a fine powder, and are mixed with 1,000 grains of litharge, 200 grains of potassium nitrate and 200 grains of sodium carbonate. This mixture is heated in a crucible in a wind furnace at a dull red heat for about 15 minutes. When still, the molten mass is poured into an ingot mold. The resulting button of lead, which weighs about 500 grains and is perfectly malleable, is cupelled direct, and the resulting gold and silver button is parted in dilute nitric acid in the usual way. When necessary the slags are cleaned by crushing to a coarse powder, mixing with 500 grains of litharge and 20 grains of charcoal, and fusing under the same conditions as before.

To estimate the gold and silver in metallic bismuth, I cupel 500 grains of the bismuth and part the buttons of the precious metals in the usual way. The bismuth may be extracted from the cupels by rejecting the white portion and crushing the stained portions to a fine powder and fusing at a red heat 1,000 grains of the powdered cupels with 800 grains of fluor spar, 400 grains of sodium carbonate, 200 grains of borax and 45 to 50 grains of powdered charcoal. Eight samples of commercial star antimony were treated by this method and were found to contain per ton of 2,240 lbs. respectively: (1). 19 dwt 14 gr Au, and 1 oz 15 dwt 7 gr Ag; (2). 1 oz 12 dwt Au, and 5 dwt 5 gr Ag; (3). 4 dwt 14 gr Au, and 6 oz 4 dwt 19 gr Ag; (4). 1 dwt 7 gr Au, and 17 dwt Ag; (5). trace of Au, and 9 dwt 19 gr Ag; (6). 16 gr Au, and 15 dwt Ag; (7). 1 oz 15 dwt 7 gr Au, and 1 oz 12 dwt 16 gr Ag; and (8). 13 dwt 17 gr Au, and 8 dwt 12 gr Ag.

Four samples of bismuth were also treated by this method and were found to contain per ton of 2,240 lbs. respectively: (1). 11 dwt. 18 gr. Au. and 72 oz. 16 dwt. 22 gr. Ag.; (2). (Australian) 3 oz. 11 dwt. 21 gr. Au. and 108 oz. 8 dwt. 10 gr. Ag.; (3). (German) 1 dwt. 23 gr. Au. and 23 oz. 16 dwt. 21 gr. Ag.; and (4). (American) 3 dwt. 6½ gr. Au. and 23 oz. 0 dwt. 14 gr. Ag.

After reading these results, one wonders that better methods have never been introduced for extracting the precious metals from antimony and bismuth.

*Abstract of a paper read before the Society of Chemical Industry, London, April 10th, 1893.

MINING AT THE COLUMBIAN EXPOSITION.

Specially Reported for the Engineering and Mining Journal.

THE CHILIAN EXHIBIT.

Chili's exhibit, of which a photograph is given herewith, is situated in the southwest end of the Mines Building. The exhibit consists chiefly of nitrates, including specimens from all parts of the nitrate fields. A tower in the center of the pavilion shows the production of nitrates from 1830 to 1890, and is accompanied by statistics showing where the production of 1890 was shipped.

The nitrate beds of Chili extend along the coast for 75 miles and are about 20 miles wide. The caliche or crude nitrate is found within a few feet of the surface. The nitrate beds vary from 2 to 10 ft. in depth and average about 3 ft. The caliche contains on the average about 40% pure nitrate of soda.

Nitrate was discovered in Chili in 1821, but none was exported until 1830. To such a degree has this industry reached in Chili that the annual income of the government from export duties reaches the sum of $20,000,000. Nineteen companies, with a capital of $27,575,000, are at present working these beds. The region in which the nitrate is found is a desert plain situated several thousand feet above the sea. The theory of the formation is that the beds were produced by the decomposition of marine animal and vegetable matter which had been thrown up by an upheaval of the land caused by volcanic eruption. The remains of pre-historic animals are found imbedded in the nitrate. The process of refining the nitrate is as follows: It is first dug up and then it is carted to crushing machines, after which it is taken to the boilers, where it is dissolved in hot water. The liquid is then run off into pans, where it is allowed to evaporate and the nitrates crystallized. It contains then about 5% of impurities. It is exported in two grades, known as the 95% and 96% grades. The greater part of the product sent to Europe is of the 95% grade, for use as fertilizers. That imported into the United States is almost entirely the 96% grade or what is called "standard." Nitrate of soda is used largely as a fertilizer in Europe. In the United States it is little known for its fertilizing qualities. It is much used in the manufacture of blasting powder and other explosives.

THE CHILIAN EXHIBIT AT CHICAGO.

The principal ports of nitrate shipment in Chili is Iquique. Among largest nitrate companies are the San Jorge, Primitive and the Rosario, the last-named company having produced at its works, Rosario de Huara, in the month or March, 1893, 142,385 quintals of nitrate.

The following table showing the nitrate exports of Chili for 10 years past is given in the "Mineral Industry"as follows, in metric tons. The full table gives the production for 20 years:

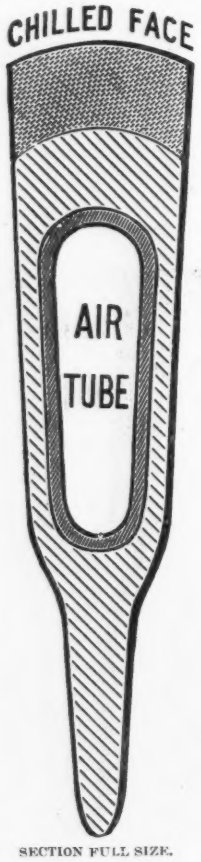
1883	584 788	1888	784.250
1884	559,616	1889	921,388
1885	429,663	1890	1,0:5,617
1886	452,788	1891	831,7 7
1887	712,768	1892	921,000

The exports of 1892 were distributed as follows: Germany, 342,000; France, 175,000; United Kingdom, 101,000; United States, 99,000; Belgium, 72,000; other countries, 132,000 tons.

CADDY & CO.'S GRATE BAR AND FURNACE.

Exhibit No. 138, in the British section of Machinery Hall, is that of Caddy & Co., Limited, of Daybrook, England. Their exhibit consists chiefly of their patent tubular, smoke-consuming, chilled-face tire bars which have met with success in England, Germany, France and other countries. The object of the exhibit here is to open up an American market. Over 3,000 furnaces were fitted last year with these bars, and the list of users contain some of the largest firms.

This grate bar differs in many respects from the ordinary pattern. Its breadth is that of any serviceable bar. It has a continuous wrought iron tubular interior, around which the bar proper is cast. A section



SECTION FULL SIZE.

THE CUDDY GRATE BAR.

is shown in the accompanying cut. The cool air enters the projecting and down-curved mouths of the tubes. A recently patented improvement passes through from end to end of the bars; in doing so it cools the bars, and in turn becoming heated, is then emitted behind the bridge, where, coming in contact with the unconsumed gases and carbons, it provides oxygen for their ignition, thereby reducing smoke. In the manufacture of the bar the best mixture of metal is used, and being cast face down, that part which, when in use, is most exposed to the heat of the fire is the most solid metal. The face, which is slightly rounded, is also thoroughly chilled by a special process to the depth of nearly ¾ in. and made so hard, that it is said, in many cases, the life of the bar is six or seven years.

Coal in Holland.—The production of coal in Holland in 1892 was 96,144 tons, of which 56,584 tons were from the Government mine at Kokrade, and 39,560 tons from the mine of the Neupricke Bleijerheide Company. The increase over 1891 was 10%.

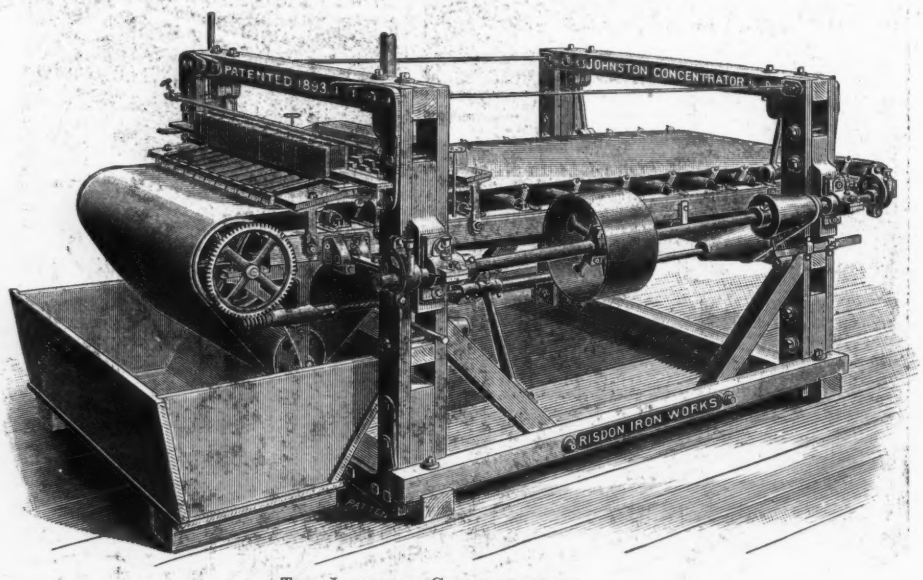
Wooden Money in England.—Wooden money, in the shape of exchequer tallies, was, says an English exchange, prior to the establishment of the Bank of England, in 1694, current in this country. Tallies was the name given to the notched sticks formerly in use in England for keeping the accounts in the exchequer. They were square rods of hazel or willow, inscribed on one side with notches indicating the sum for which the tally was an acknowledgment, and on two other sides with the same sum in Roman characters. When the transaction was completed the tally recording it was split lengthwise, so that each section contained a half of each notch and one of the written sides. One half, called the tally or check, was given to the person for whose service it was intended; the other half, called the counter tally, was retained in the exchequer until its corresponding tally should be brought in by the person who had last given value for it. It thus became a current token representing cash. After the establishment of the Bank of England, government payments were made through its agency. The use of tallies in the exchequer was abolished by Statute 23, George III. The old tallies were, by the Act 4 and 5 William IV., ordered to be destroyed, and it was burning them that caused the conflagration by which the old Houses of Parliament were demolished.

THE JOHNSTON CONCENTRATOR.

The accompanying illustration shows a form of concentrator which has been used in California with excellent results. This machine, it is claimed, overcomes the difficulties and objections to the horizontal side-shake machines, which pile the sand on the sides of the belt, or to the motion of the rocker, which throws the material to the center of the belt.

The belt frame is suspended from four non-parallel hangers placed in a frame, and by regulating their angle, the oscillation necessary to keep the sides of the belt from being overloaded with sands is obtained, while the oscillation is not sufficient to overload the belt in the center, as is the case with the rocker. The result of this motion is a concentrating surface the entire width of the belt. Small rollers at an angle of about 45° stand on a slotted base, screwed to the top of the belt frame keeping up the sides of the belt to prevent overflow. If the belt shifts to either side, it can be followed up by these rollers and answers all the purposes of molded edges, which are expensive and short-lived. The pulp box discharges the pulp in narrow channels 4 or 5 in. apart, in the direction of the belt's travel, leaving spaces on the belt where the sulphurets can remain undisturbed by the fall of water or sand, and pass up to the clear water at the head of the belt, the sand at the same time passing down unobstructed. This machine requires very little attention, is easily regulated, and will do the work of five stamps.

In recent tests made at the Gold Bluff mine, in Sierra County, Cal., the concentrators, two in number, received at first each only the pulp from five stamps falling 80 drops per minute, but for 10 days the pulp from the entire battery of 20 stamps was run over the two concentrators. Assays of the tailings showed from $1.03 per ton to a trace of gold only.



THE JOHNSTON CONCENTRATOR.

This concentrator was invented and patented by Mr. George Johnston, and is made by the Risdon Iron works, of San Francisco.

PEAT AS FUEL.*

In Denmark the peat bogs extend over 90 square miles (English measure), or about 4% of the entire area. There is no demand for the peat except for local consumption. At Silkeborg and Moseland a good deal of money has been spent in trying to bring it into use on a larger scale, but so far without success. It is either cut and dried in the air without further treatment, in which case it is called skoretorv, or is kneaded into a more or less homogeneous mass and then cut into blocks called oltetorv. In neither case does it pay to transport it to any distance. Some time ago an attempt was made to heat railroad carriages with peat, and a considerable force of men was employed by the Aalborg Mosstroelsefabrik at Lundergaard Mose, north of the Limfjord. But it came to naught and steam was substituted.

In France a small quantity of peat is cut in the districts of Brest, Cherbourg and Marseilles, but nothing to speak of, although it is sold in Lyons for domestic purposes. There are peat bogs in the Southwestern part of France, as in the district of Bordeaux, but only a local demand is supplied. Even in Charente, where formerly the industry was of some importance, the annual production is now only about 7,000 tons. There is a company at No. 8 Rue St.-Martin, Paris, founded by M. Beraud, for making articles from peat fiber. It is claimed that briquettes can be made for 50% of the cost of coal-dust briquettes.

The peat industry of Germany maintains about the same position from year to year, but the consumption is for the most part local. Very little is transported by rail, even for 20 miles, as the rate is about $2.25 per 9,600 sods for 10 miles. In the Grand Duchy of Oldenburg about 150,000 tons yearly are used, in brick kilns, bakeries, etc. The method of peat cutting used at Carolinenhorst is about the same as that of other districts. The peat is cut by three men, the first cutting from the top with a sharp square ended spade, the second from the side with a round-ended spade, dividing the turf into lengths also. This second man sometimes uses a three-sided square ended spade, shaped like a

* Abstracted from note in the British Foreign Office "Reports on Subjects Commercial Interest."

parallelogram with one of the long sides lacking. The third man lifts out the sods with a four-pronged fork having the tines turned up at an angle of 45°. The depth to which the peat is cut varies from 9 to 15 ft., the whole of it being used except some 3 or 4 in. of the top. Machine cutting has been tried, but was not found to be any cheaper than hand labor. The best peat is in the undermost layers, the first 3 or 4 ft. being used for moss litter. The cutting takes place in the spring, and the drying goes on until August. All of the peat is air dried, the drying apparatus of Rottbarth, at Gifhorn, not having been a success. For air-drying the peat is stacked by women in piles 6 ft. long, 3 ft. wide and 6 ft. high, the sods not being laid close together, but overlapping, so as to give free access of air. Each pile holds 3 cubic metres of peat, or 1,200 sods, and, when dry, it is called "klafter." The dried peat is divided into three classes. 1st. The dark peat coming from the lowermost layers, being heavier than the other kinds, and affording so little ash that 15 sods, measuring when fresh 13 × 10 × 10 in., yield only a large wineglassful. 2d. The peat lighter in color and of less weight. 3d. The peat from the top layers, less valuable than the other two sorts.

The peat exported from Germany during the last few years was as follows: 1888, 11,184 tons to foreign countries; 1889, 12,056 tons; 1890, 11,819 tons; 1891, 11,457 tons, all to foreign countries.

Switzerland takes most of the foreign exports. The imports into Germany are slightly in excess of the foreign exports, being 13,073 tons in 1891.

Peat fuel has found its greatest development in the Netherlands, where about 280,000 tons are annually used in the brick-kilns, and have a value of $665,000. It is estimated that the value of an acre of good black peat, well situated, is about $400. Along the rivers Maas, Waal, Linge, Lek and Yssel black peat is almost exclusively used in the brick kilns. The peat has to be cut and stacked and dried before it can freeze, as when once it has been frozen it loses a great deal of its heating power. In Holland peat is made into charcoal, which has about the same heating effect as wood charcoal, but being more porous and carrying more ash it is not so much in demand. The sods are air dried, and then converted into charcoal either in heaps or ovens.

Of all the European countries Russia has by far the greatest extent of peat bogs, as they cover an area of some 67,000 square miles and are capable of yielding 14 milliards of tons. The peat bogs of the crown lands in the provinces of Petersburg, Moscow, Orel, Riazan, Vladimir, Tamboff, and along the Kursk-Kieff line are said to contain 100,000,000 cub. ft. of excellent peat. In Norway and Sweden the utilization of peat is progressing faster than in any other country. It is employed as a fuel by glassworks, brick kilns, wood pulp factories, under steam boilers and by metallurgical establishments. For the last named purpose alone the annual consumption is about 30,000 tons. The peat bogs of Sweden cover an immense area in Dalecarlia, Vermland, Smaland, Halland, and North Scania. In Upper Noorland also and in Lapland there are large areas of peat deposits. The waste gases from certain ironworks are used for drying the peat, locally, and by this treatment there is a gain in heating power of 20 to 30%. The cost of making good peat fuel in Sweden may vary from $1.08 to $1.35 per ton. It is expected to contain from 30 to 40% of combustible matter, with from 7 to 10% of water.

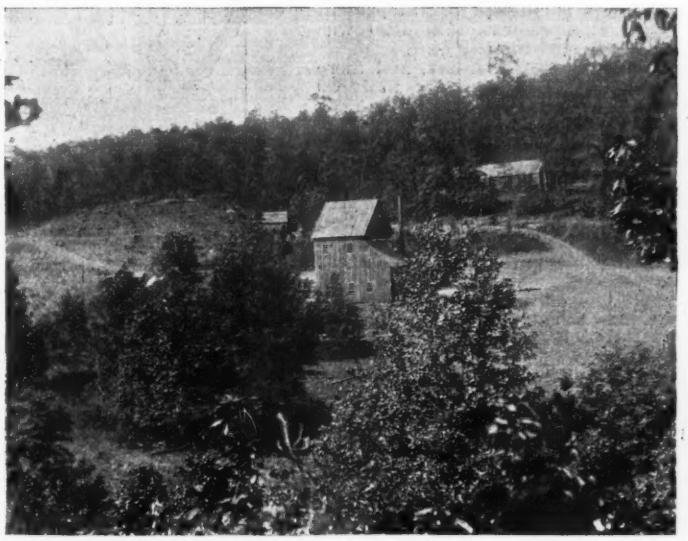
Genesis of Natural Phosphate.—According to Gautier, it has been experimentally established that at least a part of the tribasic calcium phosphate has resulted from the action of ammonium phosphate upon limestone, the ammonium phosphate having itself been derived from the bacterian destruction of ammonium remains.

Vibration of Heated Wires.—At a recent meeting of the French Society of Physical Science, M. Hurmuzescu showed the following experiment: A metallic wire through which a continuous electric current is run is placed horizontally in a glass tube containing gas, either at the ordinary atmospheric pressure or rarefied. As soon as the wire becomes red hot it begins to vibrate in a vertical plane and the containing tube becomes much hotter at the bottom than at the sides. This fact has not been satisfactorily explained by the discoverer.

THE TURKEY HEAVEN GOLD DISTRICT, ALABAMA.

Written for the Engineering and Mining Journal by W. M. Brewer.

The accompanying illustration shows the recently constructed 10-stamp Fraser & Chalmers quartz mill at the Lucky Joe mine, together with the blacksmith shop and mouth of tunnel in the rear of the mill house, and boarding-house for employees on the side hill to the right of the mill. The stamps on the ore from this mine were dropped for the first time on Thursday, June 29th. The property, which lies near the base of Turkey Heaven Mountain, on the east side, was purchased in April last by a syndicate of Cincinnati capitalists, and the work of construction and development commenced. This really marks a new era in the history of gold mining in Alabama, and because of the failure in the past to successfully amalgamate the ores of this district, the result of the work at the Lucky Joe is being watched with a great deal of interest. From the appearance of the plates after running several hours, it is apparent that with silver electroplated plates no difficulty appears in the way of amalgamation. The graphite which the ore contains, and which has given trouble when amalgamation with copper plates was attempted, passed over without leaving any slimy substance on the plates; but its appearance in the tailings, where it showed in large patches of slime, was a silent witness of what a difficulty had been successfully overcome. The ore chute, which was encountered at a distance of 76 ft. from the mouth of the tunnel, where it was cross-cut on its dip from the surface, 45 ft. above, shows an average thickness of 4 ft. It is expected that this will mill about $3 a ton, and if the other three chutes, which outcrop nearly parallel with this, show the same proportionate increase of thickness when cross-cut, as work is continued in running the tunnel, the crushing capacity will be increased, which can be easily done without increasing the expense of milling. The payroll, including all expenses, will not exceed $30 a day, or about $1 per ton of ore treated. This extremely



LUCKY JOE MILL, CLEBURNE COUNTY, ALABAMA.

low expense is because of the difference in cost of labor and supplies in favor of the South as against the West. In the latter, past experience teaches that it would be impossible to treat so low a grade ore, with such small crushing capacity, successfully. Messrs. Perrin, Hayes and Brown, of Cincinnati, members of the company, were present to witness the working of the new mill. Superintendent J. L. Loomis, who comes here from Leadville, Colo., has had charge, and has suggested changes which he found to work satisfactorily in his experience in Leadville. One of these is that the batteries are so constructed as to have no direct connection with the floor and walls of the building so that a large amount was saved in expense of construction, because it was possible to use smaller timbers with perfect security because there is absolutely no vibration to rack the framework. In hanging the outside plates, a new method has been adopted. Instead of building the frame for the plates solid from the floor up, here they are hung by means of iron hooks, one portion attached to the sides of the mortar frame, and the other firmly riveted on the sides of the plate frame; a change of inclination, which is often desirable, has been provided for by jackscrews set in the leg supports of the table. This arrangement proved perfectly satisfactory, though this would not be the case where the floor received the jar and vibration caused by the dropping of the heavy stamps. The drop adopted is 9 in., and the stroke from 60 to 70 to the minute. The ore is very easily crushed, and it is expected that about 25 or 30 tons a day will be treated, tthough, of course, this depends a great deal on the size of the screen; at present a 40-mesh is being used. The mortars are of the modern deep pattern with inside front and back plates; and amalgamating in the battery, a system not practiced in this district, will be adopted. The ore is free milling, and at present entirely free from sulphurets.

From the mouth of the tunnel, shown in the illustration, a tram road has been built to above the crusher floor, at the top of the mill, where the ore is dumped by means of an ordinary tipple upon the grizzly, over which it passes to the crusher floor below, where a Dodge crusher receives it and prepares it for feeding into the batteries. This may be said to be the first really intelligent attempt to mine and

mill the Alabama gold ores in this district. The works erected previously have in every instance, except at the Wise mine, been unsatisfactory, because, either the method of treatment was not such as the character of the ore demanded or else inexperience in amalgamation was responsible for the failure. One instance is worthy of record, where the employees in the mill pounded the heads of the stems of the stamps with sledges in order to set the tappits. Mr. Loomis has arranged a system of spittoons to receive the pulp from the plates. By this method all the pulp passes through a bath of mercury in the spittoon, and consequently any particles of gold which otherwise might escape are held by this mercury.

THE MINERAL PRODUCTION OF RUSSIA.*

The mineral industry of Russia has been in a depressed condition for the past few years, owing to bad crops. During 1889 and 1890 there was very little water in the large rivers, and intercommunication was rendered difficult and expensive. Following this there was a heavy drop in the rate of exchange and new purchases were therefore limited in amount.

In 1890 there were 172 establishments in the empire devoted to the production of pig iron, 146 to cast iron and 32 to steel. Cast iron was consumed for government and other manufactures in the following amounts: Shells, made in seven government factories, 723 metric tons; iron wares, 4,727; manufactures of iron and steel, 111,983; steel shells, 700; cannon stands, 200; nails, 22,356; ships, 1,372; iron wire, 22,749.

The production of clay for porcelain in 1889 amounted to 4,521 tons. Cobalt was produced in the Caucasus in 1890 to the amount of 14.69 tons. The amount of coke manufactured in 1890 was 295,571 tons. The production of glauber's salt was 3,267 tons, against 10,177 in 1889. The amount of iron ore mined in 1890 was 1,793,416 tons, in addition to which 2,367 tons of chrome iron ore were mined in Ural. The production of petroleum in 1889 was 3,306,814 tons, and in 1890, 3,974,531.

Phosphate rock is found in many parts of Russia, but at present is mined in but three governments. The production in 1890 was 12,896 tons; of pyrites, 17,125 tons were mined in that year.

Quicksilver is found in the government of Ekaterinoslav, and there in one place. The production in kilos. from 1887 to 1890 both years inclusive, was as follows: 1887, 63,984; 1888, 164,614; 1889, 166,905; 1890, 291,781.

The latest complete statistics attainable are given in the accompanying table, which has been compiled from official sources:

In obtaining the product of gold and silver in 1890 there were 82,108 men employed. The silver product brom lead ores in that year was derived from 74 mines. Several new mines of argentiferous lead were opened during that year. The gold product for 1892 amounted to 35,419 kilos., valued at $23,539,900 and the silver to 13,204 kilos., valued at $548,749.

Statistics lately received show that the output of coal from the Donetz Basin for 1892 was 2,526,801 metric tons. This basin has been developed at a rapid rate, and in eastern and southeastern Russia the coal is rapidly taking the place of English coal heretofore imported. With the developments now in progress, it is estimated that the output for the present year will reach 3,650,000 tons, of which about 400,000 tons will be required for the iron works in the Donetz Basin, and the rest will be available for the different markets. The figures above given are for bituminous coal; in addition in the Grushefskoi district anthracite coal of good quality is mined, the output of which last year was 484,560 tons. Most of this is used locally, but some nds its way to the Danube and even to Constantinople by way of the Black Sea ports.

The Donetz district has one quicksilver mine, which is owned by private parties. In 1892 64,836 tons of ore were hoisted from this mine, from which 344 tons of quicksilver was obtained, a small increase from the previous year, although there was an increase of nearly 25% in the quantity of ore taken from the mine. The workings have now reached a depth of 290 ft. and the quality of ore depreciates as the mine increases in depth.

Zinc ore has recently been discovered at Sadok, about 50 miles from Darkotsk, a station on the Vladikaukas Railroad. Some 1,200 tons were taken out last year and sent to different smelting works, the results obtained being very fair, so that the mines will probably be worked on an extensive scale.

MINERAL PRODUCTION OF RUSSIA.

Year	Coal, Tons.	Copper,* Tons.	Gold,† Kilos.	Iron, Tons.	Cast-iron, Tons.	Lead Tons	Manganese Ore, Tons.	Platinum, Kilos.	Silver, Kilos.	Spelter, Tons.	Steel, Tons.	Salt. Tons.
1881	3,488,901	3,460	36,763	291,854	467,905	685	11,224	2,981	9,423	4,542	292,964	830,013
1882	3,765,957	3,587	36,152	296,963	461,962	571	14,412	4,077	8,000	4,462	247,267	1,664,950
1883	3,972,192	4,350	35,735	322,411	481,097	542	17,029	3,520	7,362	3,809	221,612	1,136,566
1884	3,925,107	6,211	35,677	361,787	508,897	631	18,180	2,233	9,652	4,313	226,911	1,022,521
1885	4,623,056	4,715	33,019	261,838	526,882	714	60,458	2,587	11,239	4,579	192,659	1,131,791
1886	4,570,869	4,515	33,439	362,559	344,475	776	74,313	4,310	13,251	4,190	241,495	1,194,359
1887	4,528,104	4,983	34,865	368,949	611,388	988	58,135	4,502	15,362	3,621	225,204	1,155,280
1888	5,179,478	4,597	35,166	364,095	666,108	798	32,640	2,713	15,116	3,869	222,017	1,111,679
1889	6,206,166	4,793	37,258	427,263	739,149	577	77,937	2,632	13,840	3,681	258,418	1,392,599
1890	6,007,457	5,718	39,371	432,649	925,322	836	182,346	2,841	14,544	3,768	377,961	1,388,365

* Refined. † Unrefined.

A Bridge Across the Mersey.—A scheme has just been brought forward for the construction of a bridge over the Mersey to connect Liverpool with Birkenhead. The designs have been drawn up by Mr. J. J. Webster, London, and Mr. J. T. Wood, Liverpool. The proposed bridge is of the arched suspension type, in three spans, the roadway being suspended from an arch instead of the usual chain. The construction of the bridge allows for a clear roadway of 40 ft. in width.

* From the "Mineral Industry" for 1892. Copyright by the Scientific Publishing Company.

PETROLEUM IN BURMA.*

The practical cornering of the petroleum supply of the world by the Standard Oil Company, in this country, and the Nobel and Rothschild syndicates in Russia has turned the attention of explorers and merchants to other possible sources of supply. For some time past explorations have been going on in India, China, Burma, Sumatra, and Japan. The Sumatran and Japanese oil fields are both in the hands of parties who will explore them scientifically, but not enough is known of them as yet to form a definite idea as to the result. In some portions of Northern India, and in Beloochistan there were indications of oil, and the Indian Government has spent a considerable sum in explorations, but without definite results, and it is now understood

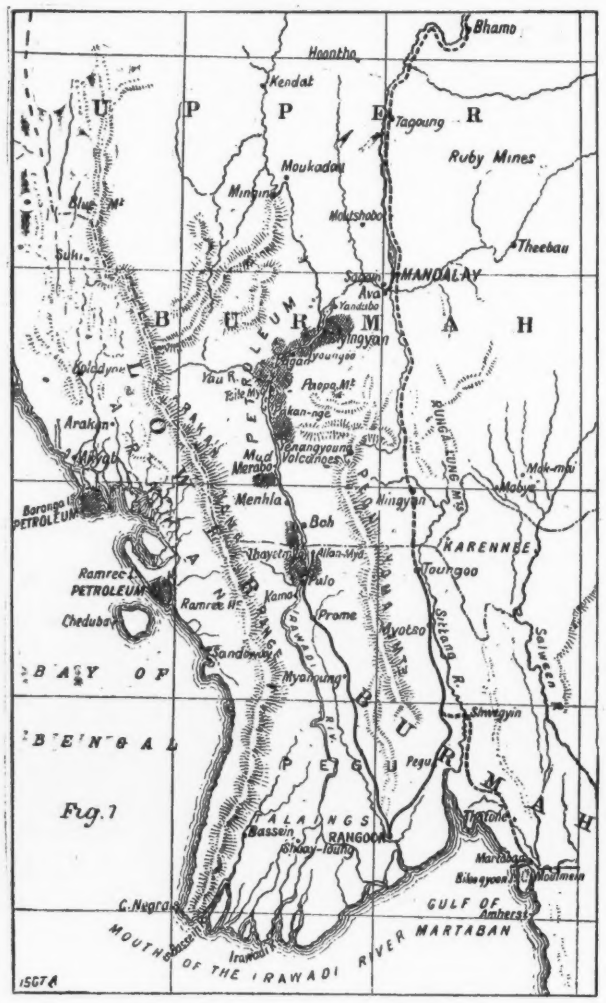


Fig. 1

MAP OF THE BURMESE OIL FIELDS.

that the work is to be abandoned. As to the Chinese oil wells, but little is known, as they are entirely under control of the Chinese Government, which is not willing to give foreigners any definite information concerning them. At the present time the most promising field in the East seems to be in Burma, where oil has not only been known to exist for many years, but has been obtained in considerable quantities with very primitive appliances. In 1876, after a large part of Burma was annexed to British India, a company was organized and operated quite successfully. For some unaccountable reason, however, they followed the native method of digging shallow pits, in which the oil is allowed to collect, and made no attempt at deep borings or thorough explorations, the only improvements introduced being the use of better appliances for digging the so-called wells.

Recently, however, the business has been taken up with a view to its proper development, by Mr. C. D. Aria, who has employed an

*Abstracted from article in London "Engineering."

expert, Mr. Fraser, to make a careful survey of the ground, and under his advice has selected numerous blocks of land where there were promised shows of oil. Other parties were also in the field, but under the management of Mr. Aria, the interests of all have been merged in a syndicate and arrangements made to work the field in a practical manner.

The oil districts so far explored are three in number; two of them are belts lying along the Irrawadi River, in the valley between the Pegu and Arakan mountains, as shown in the accompanying map, Fig. 1. The others, which have not as yet been fully explored, are the Borongo and Ramree districts, which are situated on the coast west of the Arakan Mountains. The Irrawadi, which has its source in the mountains of Thibet, is subject to floods, and its valley is sometimes completely inundated, which increase considerably the difficulties of working. Geologically, the oil bearing strata of the districts, which have been most closely examined, are of the Miocene age, or not later, and somewhat resemble those of Southern Russia. They consist chiefly of laminated and clay sands, sometimes forming soft sandstone, but some of the beds are highly calcareous, masses of sandy limestone being found. Nodular concretions of a very hard quartzitic limestone are also found. The sandstone varies in color from white or very pale yellow to dark red and blue. The clays and sand clays have a bluish gray tint. It is worthy of note that the clay beds thin out and the beds of sandstone grow thicker as the depth increases, the oil-bearing sandstone, classed by Dr. Noetting as the fourth group of rocks, having an estimated thickness of as much as 200 ft. This group consists of more or less soft, coarse, or fine micaceous sandstones of bluish gray color, changed to a more or less yellowish green, according to the amount of oil present, interstratified with hard sandstone and blue clunch. Samples of this sandstone examined contain a large amount of petroleum, and evidently constitute an oil-bearing formation of a satisfactory character. The perforation of the strata by the usual process of drilling does not appear to present any exceptional difficulties, but the wells are stated to be specially liable to cave, and therefore need to be carefully cased.

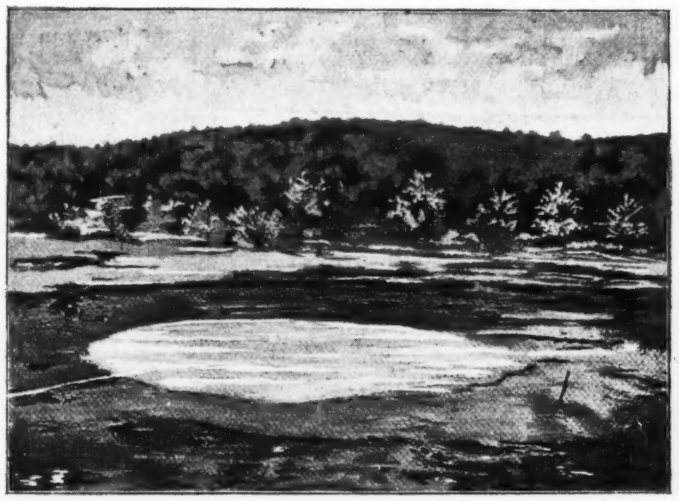


FIG. 2.

FIG. 3.

OIL POOL AND MUD VOLCANO IN THE BURMESE OIL FIELDS.

Toward the upper end of the district the oil is frequently found collected on the surface in small pools or basins, and generally in the neighborhood of what are called mud volcanoes, which are small cones of mud thrown up on the flats joining the river by volcanic action. Figs. 2 and 3 show respectively one of these lakes of oil and one of the mud volcanoes. The deposits here have never been commercially worked, but preparations are being made to explore them thoroughly by drilling.

Tests of samples of the oil made in England by Mr. Boverton Redwood show an oil somewhat similar in quality to the petroleum from Baku, in Russia, and containing a fair amount of merchantable burning oil on distillation. From one district known as the Pokoko, the oil was of an exceptionally high quality, yielding about 50% of burning oil, besides a considerable proportion of paraffine. It may be added that the districts lying along the Irrawadi are easily accessible by the river, which is navigable, that an abundant supply of wood for fuel for drilling engines and other purposes is close at hand, and that the supply of water is also ample; in fact, sometimes, too great for comfort or convenience. With the scientific handling which they will receive, the Burmese oil wells are likely to prove formidable rivals for the trade of India at any rate, and probably of other parts of the East.

Mining Accidents in Great Britain—According to the Seventeenth Annual Report of Her Majesty's Inspectors of Explosives the number of accidents noticed by the Department during 1892 was 149, causing 28 deaths, and injuring 126 persons. This number does not include mining accidents resulting from explosions of gunpowder, except where loss of life occurred. Of the total, 78 accidents occurred from use of explosives in cases to which the Explosives Act did not apply; the remaining 71 accidents occurred during the manufacture, storage, or transportation of explosives. During the past ten years there have been reported 1,402 accidents; in which 391 persons were killed, and 1,102 injured. The number of accidents and the number injured last year were above the average

GOLD MINING IN INDIA.

By A. Mervyn Smith.*

About fifteen years ago attention was called to the gold-reefs of the Wynaad, in India, by Mr. Brough Smith, a well known Australian mining geologist, but although a considerable amount of British capital was then invested none of the companies prospered. Since then the gold fields of Mysore have become very prominent, and the output is steadily increasing. Thus, in 1889 it was 76,577 oz.; in 1890, 104,932 oz.; in 1891, 130,137 oz.; in 1892, 163,140 oz., and for the first four months of 1893, 69,250 oz.

In a very interesting paper, recently read before the Mining Institute of India, Mr. A. Mervyn Smith, after giving an account of the historical evidences of the wealth of ancient India, and proving that the country of the Nareae referred to by Pliny is identical with Malabar, which forms the present western boundary of Mysore, says that the Colar gold-field of Mysore is about 10 miles long from north to south, and two miles wide, and made up of a synclinal fold of schistose rocks. The Champion lode, which alone has been found remunerative, has been traced for a distance of four miles, and it varies in width from a few inches to massive "makings" of quartz 20 to 30 ft. wide, its average being 3 ft. Its general strike is from north to south, but it is very serpentine, and often doubles back so that what may appear from surface outcrops to be two distinct veins are really portions of the same reef. The makings of quartz, too, are irregular, and there is no uniformity in the width of the lode in successive levels. The strike of the reef is also faulted by trap dikes and granitic cross-courses. The main run of the dikes appears nearly parallel with the strike of the reefs—north and south, and a trifle more easterly than the reefs. The main dike, some 150 ft. wide, crosses the Champion lode in the Champion Reef Company's property, and continues its northerly course a little to the east of the reef. So nearly parallel is it to the Champion lode that, although the crossing is seen at surface in the Champion Reefs property, yet it also intersects the Champion lode in the 750-ft. level, Rowse's shaft, nearly a mile south. The dike is in places over 100 ft. wide, and one would naturally expect considerable disturbance of the lode and country adjacent to, and for some distance on each side of, the point of intersection. But this is not the case. The lode is hard and compact, and the country rock shows little, or any, signs of the enormous disrupting force of the dike when in course of formation. Granitic cross-courses also displace the Champion lode horizontally. Notable instances of this occur in the Ooregum and Nundydroog mines in the 370-ft. levels of Probyn's and Taylor's shafts respectively. The ore is free-milling, there being very little pyrites present, so that crushing batteries and amalgamators suffice to secure the bulk of the gold. The great difficulty has been the securing of the finer particles of gold which are disseminated throughout the gangue. The chief companies now at work on the Champion lode are the Mysore, the Ooregum and the Nundydroog, which own about 14,000 ft. of the run of the Champion lode, and have up to December, 1892, extracted 206,000 tons of quartz, yielding 402,000 oz. of gold, or nearly 2 oz. to the ton. The Mysore mine has paid its shareholders in dividends £602,156; the Ooregum, £153,950; the Nundydroog, £121,700.

The Mysore company, the most important on the lode, leases 7,855 ft., and employs a staff of 2,400 persons on its mining works at Colar; 54 boilers, consuming 1,800 tons of coal per month, supply the necessary steam-power, and 90 head of stamps and 55 Wheeler pans do the milling and grinding; seven pumping engines, 13 winding engines, four air-compressors, and 40 power drills assist in the mining work; and 13 shafts have been sunk on the lode, the deepest being 1,265 ft. The responsible officers in India are Europeans, of whom 80 (41 English and 39 Italians) are employed by the company. The bulk of the workers are natives, as many as 2,300 being engaged under ground and at surface. The annual expenditure in India is about £100,000, and the home charges are about £5,000. The capital of the company is £225,000. The com-

* Abstracted from a paper read before the Mining Institute of India, March 15th.

pany started paying dividends in 1886, and since that date the shareholders have received £689,656 in dividends and bonuses; while 198,679 tons of ore have been crushed, yielding 295,292 oz. of gold, which has realized £1,149,430.

Owing to the hardness of the quartz and country rock and irregularities in the strike and make of the lode mining has been an expensive item, and averaged for 1892 about £1 4s. 6d. per ton; milling costs, 9s. 6d.; and treatment of tailings, about 5s. The entire outlay, including administration and home charges, brings up the cost per ton of ore to £2 6s. 8d., or about 41% of the yield per ton. About 90% of the assay value of the gold is recovered in battery plates and pans.

For the first four months of the present year the output of the Colar district in Mysore was 69,250 oz. gold, against 46,846 oz. in 1892, and 39,816 oz. in 1891. The Mysore Company reports 24,983 oz. and the Ooregum 23,452 oz. for the four months.

SOME FEATURES OF BRITISH MINING.

Written for the Engineering and Mining Journal by S. H. North.

The question of an eight-hours day in British industries has, for a long time, been before the country. The application of this proposal to the mining industries has been more prominent than in relation to any other trades. Previous to and since the passage of the second reading of the bill in Parliament, deputations to the Premier, contributions from all quarters to all classes of periodical literature, have been numberless. The question is, however, far from being settled yet. Miners in the largest coalfields resent the compulsory limitation, while others hail it as a step toward greater liberty. It is manifest, from a geological knowledge of the coal and ore deposits, that conditions of mining vary very considerably in different districts. In the northern coalfield the coal is not so easily worked, while in some portions of the midland strata the mineral may be gained with much greater facility. It has been remarked that a reduction of hours would not effect a diminution of output. But it is certain that there must be a natural limitation to the contraction of the time allowed for a specific quantity of work. The conditions under which the miner works are not precisely the same in all districts. For instance, in the counties of Lancashire, Cheshire, North and South Wales, the usual method is to work in a single shift; in Northumberland and Durham three shifts of hewers are employed, while among other workers underground only two shifts prevail. Again, in some coalfields the miner has to walk for a distance of three or four miles before he reaches the face, and in other parts, principally in the midland fields, a much shorter time is occupied in reaching the place of work. To the miners who work by piece, therefore, and who are paid according to the quantity of mineral raised, there are differentiating conditions regulating their wages. The miners of the United Kingdom have experimented in more ways than one to endeavor to raise the price of coal and increase their wages, but economic laws are not to be altered in their functions by a temporary and unnatural change in the conditions of supply. Some years ago there was introduced into mining in the northern fields what was known as the limitation of the vend, by which the proprietors of mines undertook to limit their production for the purpose of increasing the price of coal. It was, however, of little permanent use, and was soon relinquished. Last year, it will be remembered, the Durham miners went out on strike for about twelve weeks, believing that they could, by restricting the supply, raise the price and thereby obtain larger wages. The futility of such an action was very forcibly proved to them.

Another great and influential factor in coal mining in Great Britain has also of late been the subject, not only of a vast amount of independent discussion and objection, but has also been the cause of bringing into existence a royal commission, the payment of royalties. Valuable evidence has been adduced and sound conclusions seem to have been arrived at, setting at rest some imaginary theories regarding their evil effects. In the United Kingdom the system obtains whereby the interest of the soil is vested in the owner. This arrangement prevails in few other countries as a general thing. In Germany all minerals are the property of the State, as is also the case in France, in Belgium and in Spain. As to the amount of these royalties they differ in different counties, and even in parts of the same county, dependent upon the position of the mineral as well as upon the geographical position of the deposit. Thus in Cleveland, where the work is attended with greater difficulties and more expenditure, royalties run low—for instance, about 6d. per ton: in Lincolnshire and Northamptonshire the royalty charge is considerably higher owing to the greater facility with which the minerals are raised. In fact, it may be said that throughout the Kingdom the royalty charge is in an adverse ratio to the outlay, both financial and physical, made upon the material worked. In Germany the charge runs from 6d. to 1s. per ton; in France, from 8d. to 1s. 1½d.; in Belgium about 3s. 4d. per ton.

Turning to the facts which have been brought to light by the commission, it appears that neither the home industry nor the foreign demands have suffered through the burden of a royalty charge. The figures which represent these two departments in the coal trade are sufficient to substantiate this truth. The development of the coal production in the United Kingdom has been prodigious, as also have the exports. Take the decimal periods from 1860, we find the production in round figures: 80,000,0000 tons in 1860; 109,000,000 in 1870; 146,775,000 in 1880; 181,600,000 in 1890: while the exports were 7,400,000 tons in 1860; 11,700,000 tons in 1870; 18,700,000 in 1880, and 31,000,000 in 1890. The element of injustice that seems to be present in the British system of royalty charges is that the lessee has to pay what are known as "dead-rents" and "way-leaves," although this does not run to a very great burden. It is nevertheless an injustice, and one which, in these times of close competition and cheap production, should be compensated for in some way or removed altogether. "Way-leaves" are of two kinds, underground and above ground. The latter is necessary to remove the mineral from the mine to the place of transportation through property which is beyond the limit of the lessee's right. Underground "way-leaves" are those which pass through land which is not included in the lease of the occupier of the mineral deposits.

It was also further stated, in the examination of some important witnesses, experts in questions dealt with, that the only royalty that had any effect upon the price at certain times was the minimum royalty; that is, the charge paid upon mines or portions of the coalfield which were the least remunerative. Little benefit would be gained either by the consumer or the miner from a general reduction of royalties, for in most cases the lessee would receive the advantages accruing therefrom.

THE IRREGULAR DISTRIBUTION OF SULPHUR IN IRON.*

By J. E. Stead.

On this point an analyst cannot but speak feelingly, for there can be little doubt that different results, obtained by different chemists, which have been most discordant, have been attributed in many cases to the inefficiency of the analyst, when in reality the true cause has been due to difference in the drillings taken from various parts of the piece of iron or steel. It is a well-known fact that just as in freezing ingots of peaty water the impurity is in great measure concentrated in the central axis of the mass, or, in other words, in that part which is last to become solid, so steel and iron, in passing to the solid state during crystallization, tend to throw to the center the impurities; consequently in certain central parts of the solid steel and iron there is frequently found a segregation consisting of material containing a very much larger proportion of carbon, sulqhur and phosphorous than the average of the whole mass. It is fortunate that such less pure portions are not thrown to the exterior, but are concentrated in that part of the mass where they are least likely to have an injurious effect when the iron or steel containing such segregation is subjected to mechanical strains or stress. It has been my experience that, as a rule, the larger the mass and the more elevated the temperature at which steel is cast, the greater will the segregation be. To obtain an average sample from such material in a suitable form is a rather difficult matter if the drill is used to procure it. The only really reliable way is to plane a sectional face of the sample, and when this cannot be done, to take drillings from many different parts and mix them together, so that the whole section may be represented.

The first of the accompanying diagrams, Fig. 1, shows analyses of different parts of basic pig iron made by Mr. C. H. Ridsdale. In this pig it will be seen that there is about 2·52% of manganese, and that the sulphur is in greatest quantity at the upper surface, where it had evidently been carried by the manganese, and there can be no doubt that had the pigs remained for a sufficient length of time in the fluid state, the sulphide of manganese would have separated, just as it does in the "metal mixer." To sample such material, complete sectional slices must be taken, which must be thoroughly disintegrated and mixed.

In Figs. 2 and 3 are given the results obtained in my laboratory on testing samples of Ayresome pig iron. In these there is very clear evidence of segregation in the center of the pig, for there is about 45% more sulphur in that part than in the average of the whole pig. If drillings be taken from the pig at the points marked on Fig. 3 at the right of the diagram, and be mixed together in equal proportion, a fair average will be obtained.

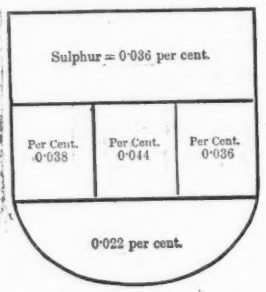
*Abstract from paper read before the Iron and Steel Institute of Great Britain.

Basic Pig

			Averages Per Cent.
Per Cent.	Per Cent.	Per Cent.	
Mn. . . . 2·40	Mn. . . . 2·42	Mn. . . . 2·42	= 2·417
S. . . . 0·14	S. . . . 0·105	S. . . . 0·14	= 0·128
Mn. . . . 2·34	Mn. . . . 2·40	Mn. . . . 2·37	= 2·370
S. . . . 0·068	S. . . . 0·070	S. . . . 0·079	= 0·072
Mn. . . . 2·19	Mn. . . . 2·28	Mn. . . . 2·100	= 2·257
S. . . . 0·047	S. . . . 0·044	S. . . . 0·047	= 0·046
Mn. . . . 2·22	Mn. . . . 2·130	Mn. . . . 2·100	= 2·150
S. . . . 0·054	S. . . . 0·040	S. . . . 0·052	= 0·049

FIG. 1.

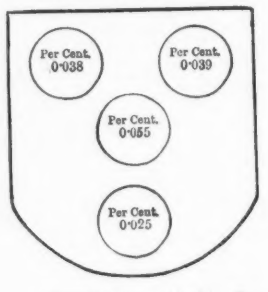
Hematite Pig Planed.



Average of mixed planings from the whole section.
Sulphur = 0·038 per cent.

FIG. 2.

Hematite Pig Drilled.



Average of drillings mixed together in equal proportions.
Sulphur = 0·039 per cent.

FIG. 3.

In Germany the charge runs from 6d. to 1s. per ton; in France, from 8d. to 1s. 1½d.; in Belgium about 3s. 4d. per ton.

THE DETERMINATION OF THE SALTS OF IRON BY AN IODOMETRIC METHOD.*

By Edouard Nihoul.

This method is founded on the fact that ferric salts react with potassium iodide in presence of an acid. Hitherto quantitative methods making use of this reaction have not been successful, as under ordinary conditions the reaction is not completed. Several experimenters, especially M. Duflos, have worked on this method, but with doubtful success so far. My modification of the process consists in conducting the reaction by heating under pressure, and eliminating the iodine as it is formed. The apparatus consists of a flask, such as is used for fractional distillation; it is closed with a perforated stopper through which passes a tube. The tube outside is bifurcated, and one of the branches communicates with a carbonic acid generator, while the other serves for the introduction of the potassium iodide. The products of distillation are received in a Volhard condenser containing a solution of potassium iodide. The ferric salt is introduced into the flask either as a solid or in solution. Hydrochloric acid is added and heat applied if needful. The apparatus is then cleared of all contained air by a current of carbonic acid. When all the air is expelled, a small excess of a moderately concentrated solution of potassium iodide is introduced by means of a small pipette. The contents of the flask are heated to ebullition, and a slight current of carbonic acid is introduced all the time. After ten or fifteen minutes almost the whole of the iodine has been expelled, and is condensed in the Volhard condenser. The contents of the flask are added to the distillate and the iodine is determined in the total liquid by a solution of sodium thiosulphate. In this reaction 0·4416 of iron corresponds to 1 part of iodine. Care must be taken to allow the contents of the flask to cool after distillation with exclusion of air by the current of carbonic acid. The determination should be made rapidly, so as to prevent the possible return of a part of the ferrous salts to the ferric state. A further modification of the process is required if it is desired to avoid adding the contents of the flask to the contents of the condenser, i. e., if it is desired to expel the whole of the iodine by distillation. This can be effected by adding concentrated hydrochloric acid in several portions during the operation, especially at its end. In this case the excess of potassium iodide is changed into chloride. In using this method it is necessary to refrigerate the Volhard condenser in order to condense the vapors of chlorine rapidly. Also, as far as possible, to make use of stoppers which have been used two or three times, as the action of iodine on new stoppers causes a loss.

I will now describe more particularly the application of this method to the determination of iron in ores. Dissolve from 0·3 gramme to 0·5 gramme of the finely powdered ore, in the fractional distillation flask, with 25 c. c. of concentrated hydrochloric acid, and then introduce a slow current of gaseous hydrochloric acid, heating almost to ebullition so as to keep the acid in as concentrated a form as possible. After solution is completed, the apparatus is put in connection with the Volhard condenser, and a current of carbonic acid gas introduced. Pour the solution of potassium iodide in slight excess into the flask and heat to ebullition. When most of the iodine has been expelled small quantities of gaseous hydrochloric acid are repeatedly introduced into the residue, and when all the iodine is thus removed, it is determined in the distillate by thiosulphate solution.

It is sometimes useful to introduce a small crystal of potassium iodide into the flask at the very first, as the hydriodic acid thus formed considerably facilitates the solution of the ore. Sometimes even the whole of the potassium iodide may be introduced at the first, but special care must be taken to expel all the air preliminarily.

If the iron is in the ferrous state or partly ferrous and ferric, the ore to be tested is dissolved in the same way as described, but without the previous addition of potassium iodide. When the solution is complete, some crystals of potassium chlorate or permanganate are added, and while the solution is maintained at ebullition, a current of hydrochloric acid is introduced until the chlorine has entirely disappeared. The apparatus is then swept out with carbonic acid, the flask reconnected to the condenser, and the operation completed as before.

Professor De Koninck has recommended the substitution of hydriodic acid in solution for potassium iodide. With this reaction the iodine is not retained so obstinately in the flask, and it may be easily expelled at the end of a few minutes by a current of steam. The use of hydriodic acid also has the advantage of not requiring the use of gaseous hydrochloric acid in the solution of the ore—that is, if the iron is in the ferric state.

*Abstract of an article in the "Revue des Mines et de la Metallurgie."

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Court of Appeals of Colorado.

Relocation After Reversion of Mining Claim.

Where a person who has located a mining claim permits an adjoining occupant to patent that part of his claim on which is located his discovery shaft, the remaining portion thereof reverts to the condition of public lands, and is relocatable; and such rule applies, though the patentee made his location after such person.—(Miller versus Girard. 33 Pac. Rep., 69.)

Court of Apreals of Kentucky.

Rescission of Contract.

A contract for the sale of mineral, gas and oil, contained in a tract of land, together with the timber necessary to develop the mines, without which mineral and timber the land has no value, executed without reflection, and without consultation, by a man over 70 years old, unable to read, and incapacitated by disease from transacting business for five years prior thereto, at a price estimated to be from one-sixth to one-tenth of the value of such mineral and timber rights, when contract was negotiated through an agent whose commission, agreed to be paid by the purchaser, exceeded the purchase price, will be rescinded.—(Horsely versus Asher's Heirs. 23 S. W. Rep., 434.)

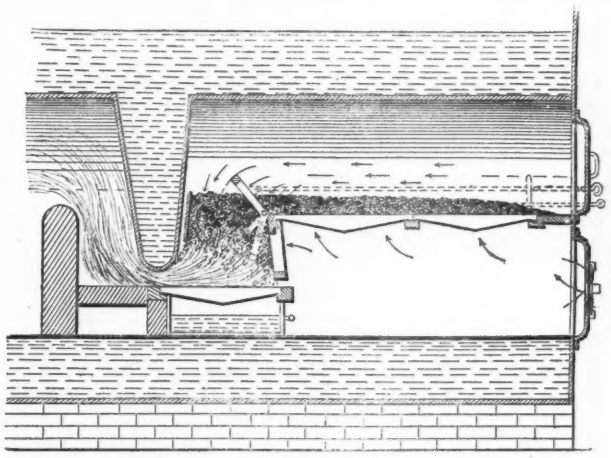
Supreme Court of Idaho.

Control of Mining Partnership.

Under the statutes of Idaho, the party or parties owning a majority interest in a mining claim or mine, in the absence of any specific agreement to the contrary, have the right to the control and management of the same, subject to the laws of the United States and of the State. Where a mining corporation works a mining claim in which it has a minority interest, against the protest of the majority interest, and mingles with the gold extracted therefrom a portion of gold from its own claim, without the consent of the other party, and the quantity and value of such portion is unknown, it cannot recover the gold so mingled.—(Hawkins versus Spokane Hydraulic Mining Company. 33 Pac. Rep., 40.)

THE THOMPSON SMOKELESS FURNACE.

The furnace illustrated herewith is an English invention which is now being introduced in this country by the Thompson Smokeless Fire Company of Pittsburg. It may be applied in various forms. The illustration shows an interior firebox arranged for hand feed, though an automatic feeder can be used, and is preferred in many cases. As the sectional view shows, there is an inverted bridge at the back of the grate, which, it is claimed, promotes the circulation of the water, and brings all the water in the boiler into direct contact with the most directly heated surface in rapid succession. The consumption of gases and the finely divided particles of carbon which produce smoke is promoted by the admission of air in proper proportions, and its passage over the burning layer of fuel. The fuel, where ordinary bituminous coal is used, should be in a layer, gradually increasing in depth toward the rear end, where the ashes and cinders are forced off and fall through a smaller grate into the ashpit. The arrangement is a combination of surface and downward draft, with a short combustion chamber formed by the inverted bridge. It somewhat resembles



THE THOMPSON SMOKELESS GRATE.

the Buchanan or the older type of Flamand locomotive boiler, except that the fire bridge is inverted and the firebox is internal. It is claimed that in working this furnace has shown a considerable economy and very complete combustion of fuel. It has good points, and with proper feeding ought to show good results, which would, we believe, be most apparent with some form of automatic feed.

The Poetsch Process in France.—La Compagnie des Mines d'Anzin has resolved to sink two shafts by the Poetsch freezing process, says the "Genie Civil."

PATENTS PUBLISHED IN GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

WEEK ENDING JULY 8TH, 1893.

7,151 of 1892. Recovering Tin from Tin-Plate Scrap, etc. J. F. Duke and F. Redman, London.
11,249 of 1892. Dissolving and Mixing Apparatus for Manufacturing Chemists. O. Hamilton, London.
11,504 of 1892. New Method of Obtaining Oxygen and Nitrogen from Air. L. Chapman, London.
12,798 of 1892. Mechanical Stirrers for Pulverulent Solids. F. D. Marshall, London, and E. Blum, Berlin.
14,495 of 1892. Machine for Breaking Pig Iron. W. Truran, Middlesbrough.
14,590 of 1892. Tinning Plates. R. Taylor and D. Davies, Swansea.
14,665 of 1892. Manufacture of Proto and Per Sulphate of Iron. C. Dreyfus, Manchester.
14,739 of 1892. Solidifying Pulverulent Burnt Ores by Stirring with Silicates of Alumina in a Moist State. N. Henzel, Wiesbaden, Germany.
14,747 of 1892. Rope Haulage Clips. W. D. Hodgkinson, Newthorpe, Nottingham.
14,949 of 1892. Percussive Drills. J. Dulait, Charleroi, Belgium.
16,567 of 1892. Picric Acid Explosives. O. Imray, London (Chemische Fabrik, Griesheim, Germany).
5,224 of 1893. Turning Plates. W. P. Thomas, Penarth, and R. Davies, Whitchurch, S. Wales.
7,389 of 1893. Electric Welding. W. P. Thompson, Liverpool (C. L. Coffin, Detroit, U. S. A.).
8,763 of 1893. Hot Blast Stoves for Blast Furnaces. H. Barlow, Massicks, and W. Crooke, Millom, Cumberland.
9,514 of 1893. Concentrating Apparatus for Sulphuric Acid. G. Siebert, Hanau, Germany.
9,800 of 1893. Blasting by Expansion of Liquids on Heating. R. Haddan, London (A. Kuehne, St. Louis, U. S. A.).

PERSONALS.

Mr. Luke W. Bryan is inspector of coal mines, in the Indian Territory.

Mr. B. B. Thayer, formerly of Montana and Idaho, has taken the foremanship of the Old Abe mine, of White Oaks, N. Mex.

Mr. F. L. Erickson, formerly with the Etiwan Phosphate Company, has been chosen superintendent of the Pharr Phosphate Company.

Mr. James D. Hillhouse is State inspector of mines, of Alabama, and has his office in Birmingham. He succeeds Mr. J. B. de Hooper, resigned.

Mr. Charles Evans has been appointed State inspector of mines, of Missouri, succeeding C. C. Woodson, resigned. His office is in Jefferson City.

Mr. W. W. Smith has been appointed manager of the Moundsville Mining and Manufacturing Company, at Moundsville, W. Va., succeeding Mr. J. G. Cook.

Mr. William R. Boggs, Jr., is now in Mexico, on a professional trip. His address until September 20th will be in care of A. C. Young, Apartado 809, City of Mexico.

Mr. George L. Houser has been appointed general coal forwarding agent of the Lehigh Valley Railroad. He has been for some time agent of the road, at Caxton, Pa.

Mr. J. S. Lord has resigned his position as commissioner of labor of Illinois, to accept the position of secretary and treasurer of the Chicago & Kansas City Coal Company. His successor in charge of the State labor bureau is Mr. George A. Schilling.

Mr. John E. Rothwell, mining engineer, who has been acting as a special correspondent at the World's Fair, for the "Engineering and Mining Journal," has gone to Arizona on professional business in examining mines and testing ores by the chlorination process.

Commodore T. D. Wilson has been relieved from duty as Chief of the Bureau of Construction, Navy Department, at his own request, on account of ill health. His successor as chief of the bureau is Naval Constructor Philip Hichborne, who has been chief assistant for several years.

Prof. Max von Pettenkoffer, the eminent chemist and founder of experimental hygiene, celebrated his 50-year jubilee, as Doctor of Chemistry, at Munich, on June 30th last. At a special meeting of Bavarian Academy of Science Prof. Dr. Lossen presented decorations from the Emperor of Germany, the King of Bavaria, etc., and most of the German and several foreign universities sent deputations of professors and students to present congratulations.

OBITUARY

Robert Whitehill, who died in Newburg, N. Y., July 17th, aged 48 years, was for a number of years engaged in manufacturing engines and other machinery in that city. For some years past he had been president of the Whitehill & Pictet Ice Machine Company.

George W. Parsons, who died in Lock Haven, Pa., July 15th, aged 78 years, was a well known hydraulic engineer, and had had charge of important works in Pennsylvania, West Virginia and elsewhere. At one time he was a member of the commission on improvements of the Ohio.

John Kimball Gordon, who died of fever in Puerto Limon, Costa Rica, June 21st, aged 45 years, was for a number of years in business in New York. For several years past he had resided in the West Indies and in Central America, representing parties in this city who have invested capital in mines there.

Joseph Hutchins Colton, who died in Brooklyn, N. Y., July 19th, aged 93 years, had been for 63 years in business in New York as an engraver and publisher of maps. The name of the Colton firm has become known everywhere for the care and thoroughness with which their work was executed, and the pains taken to make their maps correct.

Henry T. Weld, who died at his country residence, in Allegheny County, Maryland, July 19th, aged 78 years, was born in England, and in 1841 came to America as a civil engineer and as representative of the English stockholders in the Consolidation Coal Company. He later discovered the large deposit of valuable fireclay at Mount Savage, Md., and organized the New York Mining Company, now known as the Union Mining Company. He was a promoter of the Cumberland rolling mills, and was interested in the opening up of the Keystone coal regions, and the establishment of lumber mills at Fair Hope, Meyersdale, Southampton and Sand Patch, Pa., in all of which he was interested at the time of his death.

SOCIETIES AND TECHNICAL SCHOOLS

Societe Geologique de France.—The yearly reunion of this Society will be held at Puy, beginning September 14th, and lasting 10 days. There will be several meetings for business and discussions, but most of the time will be occupied by examinations of the geology of the neighboring country, which presents many points of interest.

Civil Engineers' Club of Cleveland.—At the regular meeting, July 11th, Mr. Harold P. Dyer was declared elected a member. Mr. W. H. Searles reported on behalf of the local committee on Columbian Exposition, that the souvenir book had been prepared, and exhibited a sample copy. The committee will forward a number of these books to Chicago and copies will also be mailed to members of the Club. It was resolved that the Club hold no picnic this year. Mr. E. P. Roberts then read the paper of the evening entitled "Preliminary Surveys for Electric Light Stations." The paper was discussed by Messrs. Ludwig Herman, J. W. Langley, A. A. Skeels, A. H. Porter and C. O. Palmer.

American Society of Civil Engineers.—The annual convention this year will be held in connection with the General Engineering Congress, in Chicago, beginning July 31st. There will be no meeting of the Society in convention; all papers will be presented to Section A of the Congress of Engineering. This section—Civil Engineering—is under the charge of the American Society of Civil Engineers. The business meeting of the annual convention, for members only, will be held on Wednesday evening, August 2d, at 8:30 p. m. The adjourned business meeting will be held on Friday evening, August 4th, at 8:30 p. m. At this meeting the president's address will be read, and the nominating committee will be elected. Unless otherwise notified at the time, these meetings will be held in the hall of the Engineering Headquarters, at No. 10 Van Buren street.

International Irrigation Congress.—The annual meeting will be held this year in Los Angeles, Cal., begining October 10th, and continuing one week. The list of subjects prepared by the executive committee includes questions of irrigation engineering, with the construction of dams and waterways; State laws on the subject of irrigation, the relations of the National Government to the irrigation interest, which includes the question of the cession of arid lands to the several States, irrigation securities and financial questions connected with the subject, the bearing of irrigation on horticulture and agriculture, and, lastly, the methods of irrigation and the machinery and appliances to be employed therein. It is planned to have a number of papers on these subjects by authorities best qualified to speak, and to follow each paper with a general discussion of the matter in hand.

Aerial Navigation Congress.—Among the various congresses to be held at Chicago this summer, there is to be a conference on aerial navigation, August 1st-3d. The local committee is composed of engineers and university professors, who have made an effort to elicit papers and discussions from capable scientific writers and experimenters throughout the world. The secretary, Prof. A. F. Zahm, of Notre Dame, Ind., has received valuable papers describing recent experiments of inventors in this and European countries, Algeria and Australia. Among the contributions are photographs and descriptions of several steam flying machines and of the military balloons of different nations. Among the scientists present will be Prof. J. W. Langley, secretary of the Smithsonian Institution, and Mr. O. Chanute, formerly president of the American Society of Civil Engineers, both of whom have conducted experiments in this field.

Engineering Association of the South.—At the meeting in Nashville, Tenn., July 13th, the subject of "Smoke Prevention" was presented by Prof. Olin H. Landreth, of Vanderbilt University. The paper discussed successively the causes, the effects of smoke and the remedies for it. Consideration of the causes suggests the agencies and the mechanical devices for the prevention of smoke; these latter, so far as pertains to steam boilers, are classed as mechanical stokers, air flues in the walls and gratebars, coking arches, dead plates, downdraught furnaces, steam jets for injecting air and mixing the gases, baffle plates and double furnaces. Smoke prevention must be accomplished by educating the public to consider smoke a nuisance that unquestionably can and should be abated, for the smoke producers are very slow to be convinced that this abatement is to their interest. Following the influence of public sentiment, laws are to be enacted, and provision made for their enforcement and for furnishing to smoke producers, when desired, professional advice regarding the means and appliances for smoke prevention. The paper gives the statutes passed in Chicago, Cincinnati, Cleveland, Pittsburg, New York, Rochester, Boston, Denver, the State of Ohio and the city of Birmingham, England, with statements of the success attained in preventing smoke in these localities, success in each case being proportional to the vigor of action taken; it also contains descriptions of various mechanical devices for smoke consumption, and closes with a list of literature on the subject.

The Congress of Chemistry.—The committee in charge of the Congress have selected Monday, August 21st, as the date of the opening of the Congress of Chemists to be held in connection with the Columbian Exposition, in Chicago. The chairman of the committee appointed by the American Chemical Society is Dr. Wm. McMurtrie, 106 Wall street, New York, N. Y. The chairman of the committee appointed for co-operation in this congress by the American Association for the Advancement of Science, Chemical Section, is Prof. Ira Remsen, Johns Hopkins University, Baltimore, Md. The chairman of the committee of the World's Congress Auxiliary, on Congress of Chemists, is Prof. John H. Long, 2421 Dearborn street, Chicago, Ill. The various committees have organized by selecting Dr. H. W. Wiley, chief chemist of the Department of Agriculture, Washington, D. C., as chairman, and Prof. R. B. Warder, Howard University, Washington, D. C., as secretary. The work of the Congress has been divided into ten sections and a temporary chairman has been selected for each section, as follows: Agricultural Chemistry, H. W. Wiley, Department of Agriculture, Washington, D. C.; Analytical Chemistry, A. B. Prescott, University of Michigan, Ann Arbor, Mich.; Didactic Chemistry, W. E. Stone, Lafayette, Ind.; Historical Chemistry and Bibliography, H. C. Bolton, University Club, New York; Inorganic Chemistry, F. W. Clarke, Geological Survey, Washington, D. C.; Organic Chemistry, I. Remsen, Johns Hopkins University, Baltimore, Md.; Physical Chemistry, R. B. Warder, Howard University, Washington, D. C.; Physiological Chemistry, V. C. Vaughan, University of Michigan, Ann Arbor, Mich.; Sanitary Chemistry, H. Leffmann, 715 Walnut street, Philadelphia, Pa.; Technical Chemistry, Wm. McMurtrie, 106 Wall street, New York, N. Y. General and special invitations have already been issued to foreign chemists and many replies have been received, indicating a large attendance of chemists from abroad at the Congress.

INDUSTRIAL NOTES

The Schultz Gas Fixture and Art Metal Company issue a tasteful and handsomely executed souvenir of its exhibit at the World's Fair.

The new buildings of the Chicago Steel Works are nearing completion, and will be in full operation at Chicago Heights, Ill. These buildings cover five acres of ground.

The Chicago Iron Works issue a handsome card having a plan of the Mines and Mining Building, accompanied by directions to the company's exhibit in the building.

The Iroquois Furnace Company, Chicago, Ill., went out of blast this week. The furnace will be thoroughly overhauled, relined, and will go into blast as soon as the iron situation improves.

The Solvay Process Company, at Syracuse, has just ordered from the Goulds Manufacturing Company, at Seneca Falls, two special triplex chemical pumps for the use of the former company, in its works at Syracuse.

The Casey & Hedges Manufacturing Company, Chattanooga, Tenn., recently shipped to the Indian Mountain Coal Company, at Jellico, Tenn., two 100-H. P. boilers with full equipment of heater, stacks, etc., and one 200-H. P. automatic engine.

The Riverside Bridge and Iron Works, Paterson, N. J., have been placed in the hands of a receiver. The company has been doing a large business and the assets exceed the liabilities, the trouble being caused by slow collections chiefly.

The Edward L. Dent Iron Works Company, Georgetown, D. C., has just completed three immense castings to be sent to the Philippine Islands. The castings will form the support of an immense telescope to be erected in the observatory in the city of Manila.

The Dallet Iron Company, New Boundbrook, N. J., was recently granted a charter for the manufacture of iron and steel and to do general foundry and machine shop work. The capital stock is placed at $50,000, and is partly taken by J. Dallet, of East Orange, N. J.

The General Electric Company announces that it will shut down the iron foundry, at Lynn, employing 300 hands. The reason assigned is that castings can be bought outside cheaper than the company can make them. Works were started only a short time ago.

The contracts for steel gun forgings for the Navy Department have been divided, the Midvale Steel Company taking the contract for 3-in., 4-in. and 8-in. gun forgings, and the Bethlehem Iron Company those for the 5-in. and 12-in. guns. The price for the 4-in. forgings is 28¼ cents per pound, for 8-in. 28 cents and for the 12-in. 28½ cents.

The Frick Company, Waynesboro, Pa., issue a handsome illustrated catalogue, describing their Corliss steam engines, including upright, horizontal, tandem and cross-compound engines for various purposes. A large number of these engines are in use in factories, electric light stations, rolling mills, etc. The "Eclipse" Corliss is the company's special type.

The Berlin Iron Bridge Company, East Berlin, Conn., is building the iron roof on the new purifier-house for the Philadelphia gasworks. The building will be 70 ft. wide and 180 ft. long, the roof constructed entirely of iron, covered with slate. The new power-house for the Worcester Traction Company will also be designed and built by the same company.

Pratt & Whitney, Hartford, Conn., issue each year a new edition of their descriptive and illustrated catalogue, which has now grown into a solid book of 392 pages. This, with the fact that there is no superfluous matter in the book, the descriptions and references being for the most part well condensed, gives the reader some idea of the great variety of machine tools, gauges, etc., made at these well known works.

The M. C. Bullock Manufacturing Company has issued two new Columbian circulars, Nos. 24 and 25; in the former they briefly describe seven of their diamond drills, the Champion ventilator and band friction hoist, and in the latter they illustrate the "Monarch" rock drills, giving table of capacities and powers of the seven sizes in which they are manufactured. Among the diamond drills, there are several new types and styles. These have been brought out to meet the special requirements of customers. The "Monarch" rock drills have been well received by miners, contractors and quarrymen, in whose hands they have been placed, and there is a steady and growing demand for them.

Jenkins Brothers, New York, have recently made great improvements in their valves, having adopted a new form of holding the disc holder in place, increased the number of bolts in valve bonnets, and also increased the thickness of flanges, to make the valves suitable for high steam pressure. It is their intention to manufacture but one grade of valve, so that it will not be necessary for their customers to mention "valves for high steam pressure," as they will be suitable for any pressures. They have also made a great improvement in the manufacture of a rubber compound for use on high pressure steam. For nearly two years they have been using and testing this rubber compound in the manufacture of their discs, and the results have been more than satisfactory, having passed the experimental stage. These improvements, made in the manufacture of their goods are offered without any increase in prices.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GENERAL MINING NEWS.

For the month of June the Bureau of Statistics, Treasury Department, reports the exports of mineral oils from the United States at 84,740,890 gallons, an increase of 21,597,556 gallons, or 36%, over June, 1892. For the fiscal year ending June 30th the exports were 799,370,880 gallons, an increase of 89,069,786 gallons, or 12·5%, over the preceding year. The exports last year were made up as follows: Crude oil, 111,296,264 gallons; naphthas, 17,238,336 gallons; illuminating oil, 638,431,417 gallons; lubricating and paraffine oils, 31,946,433 gallons; residuum, 458,430 gallons. About 58% of the exports were from New York, Philadelphia coming second with about 36½% of the total.

ALABAMA.

Tennessee Coal, Iron and Railroad Company.—The differences between this company and its coal miners in Alabama, which at one time threatened to result in a general strike, were finally adjusted at a conference held at Bessemer. Both sides made some concessions. The company agreed to pay the men at Pratt mines and Blue Creek, the largest mines, the old scale of wages on a basis of 45 cents per ton, and the miners at Blocton and Gurnee 43 cents per ton, the last two named being reduced 2 cents on the ton. It is understood, however, that the Blocton and Gurnee miners are to have a slight reduction made to them in the prices of supplies, etc. The agreement is for a year, and the mines are now actively at work.

ALASKA.

Alaska Treadwell Gold Mining Company.—According to the superintendent's report, the June statement shows as follows: Shipment of bullion, $57,177; tons of ore milled, 18,312; tons of sulphurets treated, 341; of bullion there came from sulphurets $15,972. Estimated gross expenses for period, $22,123.

ARIZONA.

(From our Special Correspondent.)

Mining assessments falling delinquent during the month of July will aggregate $20,000.

CALIFORNIA.

Alameda County.

(From our Special Correspondent.)

H. H. Pitcher and J. Taylor are about to build works at Livermore. Hitherto considerable quantities of manganese and chrome ore have been shipped in bulk with heavy transportation charges. By shipping a product only the saving in freight and increased market value will enable the deposits to be worked to a profit.

Amador County.

(Reported for the "Engineering and Mining Journal.")

Irma Gold Mining Company.—This property has been worked for nearly a year after having been abandoned for nearly 30 years. The formation is granite, and the ledge averages 18 in. thick. The ore runs $90 per ton gold, and $2 silver. It contains 27% sulphurets, which are reduced by the Clinton Consolidated Mining Company's chlorination works. These give returns of $250 gold and $5 silver per ton. The vein has been sunk on for a depth of 210 ft., and has been exposed for 250 ft. The length of the shoot is not yet known, but the levels are now being pushed forward by power drills. For our information we are indebted to the courtesy of Mr. David Fisher, superintendent.

Calaveras County.

(From our Special Correspondent.)

Gaston Hill Mining Company.—This company has just incorporated, with a capital stock of $10,000. The directors are J. J. Sturgeon, J. S. Bush, F. McPherson, A. F. Coffin and J. D. Eby.

Inyo County.

(From our Special Correspondent.)

Montezuma Mine.—When this mine was closed down, some years ago, a large quantity of ore was lying on the dump, and after experimenting A. Fyfe found that by leaching a profit from it could be obtained. He has put in a small plant capable of working 12 tons each day. The ore carries from $8 to $30 gold and from 18 to 20 oz. silver per ton.

Mono County.

(From our Special Correspondent.)

Bulwer Consolidated Mining Company, Bodie.—Bullion valued at $7,823 has been shipped to Carson. A small seam of fair grade ore is showing in the face of the north drift, 200 level, from No. 2 cross-cut.

Standard Consolidated Mining Company, Bodie.—A bullion shipment, valued at $6,127, has been received at the San Francisco office.

Nevada County.

Brunswick Consolidated Gold Mining Company.—The following is from Superintendent Hanley, under date of July 12th: Ledge in 700 ft.; drift is from 12 to 18 in. wide. The rock next to the hanging wall looks well, being full of sulphurets and showing some fine gold. In the 700-ft. upraise the ledge will average a foot wide, and looks like fair milling ore. The ground is hard just at present, but looks as though there would be a change soon.

San Bernardino County.

(From our Special Correspondent.)

O'Byrne Mine, Ehrenburg.—This property is really situated in the Colorado desert, in the Old Woman's Mountains. It is the first mine to be located in this section, for the surrounding country has never hitherto been prospected. The first shipment of 20 tons of ore has been made to the Selby works, at Port Costa, and assays of the ore made at El Paso and Pueblo, show 124 oz. gold per ton, with traces of lead and silver. The ledge is of decomposed quartz, 13 ft. wide. Transportation rates take all the profit at present. The ore has to be packed by burro from the Old Woman's Mountains, a distance of 73 miles, to Ehrenburg, at a cost of $20 per ton; $14 per ton for freight to Port Costa, $13 for reduction and $3.50 for sacking bring the total shipping and reduction averages up to $50.50 per ton. A tunnel has been driven for a distance of 23 ft. in, tapping the ledge at 220 ft. below a perpendicular shaft, sunk 24 ft. At the surface the ledge is 8 ft. wide, making as it goes. Unfortunately, wood and water are both scarce, the former having to be packed for 15 miles. Mortimer O'Byrne, who is owner also of the Southern Cross the Red Cross and other mines, and J. D. Barry, propose sinking for water; the mine being situated in the heart of the desert, they expect to sink to a great depth.

COLORADO.

El Paso County.

Victor Gold Mining Company.—Wm. Trevorrow, superintendent of this gold mine, writes under date of July 13th, as follows: We have run the third level east about 40 ft. since last I wrote; we have a good quality of ore here, and I think improving. No. 3 west is doing well; we are in here about 200 ft. from the shaft, and the rich ore holds its own. The raise from this drift is up about 40 ft. in a good body of ore all the way. No doubt it will continue through to the second level, as that level had rich ore the full length. Drifts Nos. 4 east and west are being pushed ahead as fast as possible, both in rich ore. Drifts Nos. 1 and 2 are both in good ore, and are now in something over 350 ft. from the shaft. Stopes in all parts of the mine are doing nicely; we are shipping our usual amount of ore and it will run fully as well as last month, which was a little over $300 per ton in gold.

Lake County.

(From our Special Correspondent.)

Since last week many additional mines have been closed. Within the city limits there are the Carleton, the S. Small, Walcott, Penrose & Grey Eagle, Sixth Street and Bohn. Fryer Hill is practically abandoned. The Harvard, Dunkin, Matchless, Lee, Pawnolos group and Little Silver are closed down tightly. The great carbonate hill, the center of mining activity here, has a deserted and forlorn appearance. Among recent shut-downs are the Mahala, Small Hopes, Niles-Augusta, Gazelle, Forest City, Leadville Consolidated, Dome, Dores and a number of small leases.

On Monday the Holden Smelting and Refining Company's plant here was attached. This was brought about by the filing of a mortgage in favor of W. D. Tod, of Denver, for $108,000. Excitement ran high for a while, and over $175,000 in attachments were placed on the plant. Arrangements were made to keep running, but on Thursday the coke gave out and as the railroads had levied on all coke and coal in cars the smelter was compelled to close down; 150 men were let out. An attempt is now being made to arrange with the creditors so that work can be resumed.

The Elgin smelter, the smallest in the camp, closed down entirely this week, letting out 75 men. Superintendent Wilder, in speaking of the shutdown, says that it is due to there being no market for the bullion, consequently the company does not feel justified in producing any. The smelter has ore on hand and if conditions ever improve the plant will be started up again.

Bradshaw.—This mine, worked by lessees, has been thoroughly developed this season, and on Thursday a strike of excellent mineral well studded with gold was made in an upraise run from the main incline. The lessees think that they have the mother vein and will vigorously prosecute work.

Fanny Rawlings.—This mine is among the few properties that are being worked. Being a gold producer and the mineral being a first-class flux, no trouble is experienced in disposing of all the ore that they can mine.

La Plata County.

In the Durango district there is much activity in prospecting, and a number of placer claims have been taken up on La Plata River.

Kankakee.—The Patrick brothers have commenced work on this mine. The outcroppings are rich, and the prospects have attracted a number of others who have taken up claims in the vicinity, in the Gold Run district. Two claims in this district, the Silvanite and the Good Hope, are shipping ore at present, as it appears to be rich enough to stand cost of transportation to Silverton. On the Good Hope a force of men is employed drifting on the vein. The ore is assorted and packed for shipping.

Ouray County.

(Reported for the "Engineering and Mining Journal.")

A contract of 450 ft. has been let to tap the Raleigh vein, an extension of the Virginius. This property has lately been taken by some Eastern parties, who have sufficient confidence in it to advance capital.

Wages of miners were recently reduced from $3.50 to $3 per day on account of the low price of silver.

Trust Ruby Mine.—This mine has closed down for 60 days in order to repair the mill and reset the air compressor, and also to retimber the mine, which was left in bad shape by the former management. Operations are to be conducted on a larger scale than heretofore.

San Miguel County.

The Silver Bell, Caribou, Montezuma, Capitan, What Cheer and Smuggler Union properties have been closed down. The force of men on the San Bernardo and Silver Pick mines has been greatly reduced.

San Miguel Consolidated Gold Mining Company.—According to the Telluride "Republican" the upraise on the Hamburg, one of this company's Bear Creek properties, on which the air compressor has been steadily kept at work, has been pushed some 30 ft. into the trachyte formation on a steadily widening vein that under the panning tests shows well in gold. The vein is now showing a breast of between 7 and 8 ft. of gold-bearing quartz that widens as the upraise is advanced. Superintendent Kramer informs the "Republican" that he will at once commence drifting on the vein both ways from the upraise, and will open ground for stoping as rapidly as possible. The mine has direct connection with the mill over the Bleichart tramway and through the Champion level. On the Champion and Northern Ohio, belonging to the same company, upraises are being driven night and day. Both carry large bodies of ore that in a short time will, it is expected, enable the 120-stamp mill to be run steadily to its full capacity.

FLORIDA.

The shipments of phosphates from Punta Gorda for the six months ending June 30th were 34,502 tons, of which 24,302 tons were consigned to foreign ports and 10,200 tons to domestic ports.

GEORGIA.

Lumpkin County.

Beacher Mine.—This mine is now being successfully worked by John Jenkins and Judge W. C. Thomas.

Chestatee Company.—The Dahlonega "Nugget" of recent date says: On account of the similarity in names, some persons at a distance have got the Chestatee Company confounded with the Chestatee Gold Mining and Dredging Company. These are entirely two different concerns, the Chestatee

Company having no connection whatever with the insolvent Chestatee Gold Mining and Dredging Company. The Chestatee Company is on a firm financial footing, has a valuable property, and one of the finest plants South is now in course of construction upon it.

White County.

Nacoochee District.—The Cleveland "Progress" says that work on the newly discovered gold vein on Number 10, is being pushed with vigor, and the returns from the ore that has been milled, shows it to be of a very high grade.

Union Gold Gravel Company.—Three parties are now working on the placer mines of this company, on Duke's Creek.

IDAHO.

Alturas County.

Buttercup Mining Company.—The miners on this property have refused to go to work on a reduction of one-third in their wages.

Camas No. 2 Mining Company.—It is thought that work will be resumed on this group of gold mines. The plant will be run by electric power transmitted from a distance of nine miles.

Queen of the Hills Mining Company.—Operations have been resumed on this property, the engineers having agreed to the reduction of wages to $3.25 per day.

Red Elephant Mining Company.—This company has made an agreement with its miners to work on the following basis: With silver at 85 cents per ounce a man at $3 per day would receive 105 oz. and a fraction of silver per month. At the close of the month the price of silver during the month will be reckoned, an average drawn and the wages computed on that basis; thus, if silver sells at 80 cents an ounce, a man at $3 per day will receive $84.50 per month. With silver at 70 cents he will receive $74, and with silver at 60 cents. $63.50.

Owyhee County.

Black Jack Mining Company.—This property is shut down to await a raise in the value of silver. Some 60 men are thrown out of employment.

Lamar Mining Company.—This company has laid off about 30 miners, as shipments of ores to the Denver smelters will be suspended. This will reduce the output about $15,000 a month.

Poorman Mines, Limited.—A proposition is brought before the meeting of this company in London on the 4th inst., to amalgamate with the Poorman Consolidated Mines, Limited, and to acquire the properties of this company with its milling and water rights, the shareholders in tre present company receiving four shares in the new company for each three in the old. The chairman of this company, Mr. J. H. Bretherton, recommended the passage of the resolution authorizing this, which was done later. Explaining the proposition he attempted to show to the stockholders that the addtional issue of stock, and the interest the Poorman stockholders would obtain in other properties, were equivalent to a dividend. Mr. Bretherton's arguments are difficult to follow, but there is one thing certain, that as the Poorman Mines, Limited, is the only property in its neighborhood capable of producing largely, the South Poorman & Idaho Milling Company has lost nothing by this transfer. It remains to be seen, however, if the mill, for which the company is paying nearly $150,000, is worth the figure they are paying for it. Mr. Bretherton further figures another dividend from an estimated saving due to projected improvements in this mill, which he will require in the future.

ILLINOIS.

Henrietta Mining and Milling Company.—This company has filed articles of incorporation, with office in Chicago. The capital stock is $1,000,000, and the incorporators are Henry Ferbrache, F. E. Stevens and M. S. Teneyck.

INDIANA.

Clay County.

Hoosier Coal Company.—This company, which has its headquarters in Terre Haute, and operates several mines near Brazil, made an assignment July 18th. The liabilities are about $40,000. Work in the mines will be stopped for the present.

INDIAN TERRITORY.

(From our Special Correspondent.)

Peoria District.—Your correspondent visited this new mining district in the Indian Territory and found a typical new mining camp with a population of about 350, all more or less engaged in prospecting and mining lead and zinc ore. This new field has been opened up by the Peoria Mining, Construction and Land Company, which is an incorporated company, with a capital stock of $1,000,000. The officers of the company are W. J. Thompson, Gloucester, N. J., president; W. H. Harley, secretary and treasurer; J. P. McNaughton, Max, I. T., general manager; J. A. Baker, Pittsburg, Pa., superintendent. The company has placed $100,000 cash in the treasury to be expended in development and improvements on 20,000 acres of land owned and controlled by the company. Most of the improvements and development are being made at and around the town of Peoria, which is located in a beautiful valley called Warren's branch, a tributary to Spring River. The company is now prospecting and developing about 30 shafts, which range in depth from 10 to 115 ft. A visit to these shafts proved that a considerable quantity of float or surface lead was found at a depth of 10 to 20 ft. in a drift formation of clay and boulders. Some of the shafts proved up good deposits of silicate of zinc and some zinc blende ore. The character of the formation, as far as proved by development, is about the same as that of the mines of southwestern Missouri and southwestern Kansas. The company has put two steam drills at work and will test the formation down to a depth of 200 to 250 ft. It is proposed to lease to miners and mine operators on the royalty plan portions of the land; some of it will also be leased out as grazing and farming land.

KENTUCKY.

A Jackson, O., syndicate has purchased 1,700 acres of mineral and timber land between the Tuck and Louisa forks of the Big Sandy River. A part of this territory is said to be underlaid by five veins of coal aggregating 45 ft. in thickness. The rest is underlaid by three seams aggregating 15 ft.

MICHIGAN.

Iron—Menominee Range.

It was reported in Chicago on July 15th that the Schlesinger mining syndicate had failed. This was denied at Milwaukee, but at the same time the Bonton Foundry Company, which is intimately connected with the syndicate, announced its failure and filed an assignment with liabilities at $200,000 and assets of $175,000. At the same time the Chicago & Northwestern Railway Company filed an attachment against the Buffalo mine, in the Marquette Range, which belongs to the syndicate. Mr. Ferdinand Schlesinger then sent word from Milwaukee that the attachment proceedings against the Buffalo mine, at Negaunee, Mich., were not fatal, and that the syndicate would pull through all right. It is said that the Schlesingers will be able to weather the storm, the estimated value of the mines owned and controlled by them being about $20,000,000, in addition to which they own many furnaces and are interested in foundries in several large cities. They own a great chain of mines in Northern Michigan, including the Chapin mine, the Buffalo, Prince of Wales, Dunn, Armenian, York Iron Company, Queen, Aragon, Claire and Sunday Lode. In Chicago, it is reported that a great deal of the Schlesinger paper is out, but little or none of it is held there. It is very unlikely that the syndicate will fail as such on account of its large foreign backing, but it is more than possible that some of the smaller enterprises may be allowed to go by the board.

Copper.

Atlantic Mining Company.—During June the output was 233 tons, as compared with 247 tons for May.

Atlantic Mining Company.—Work on the new mine railroad is progressing rapidly. About 1½ miles of track has been laid, and some five has been graded, ready for tracklaying. A standard gauge road is being built, so that the road will be in shape to connect with any of the through lines that may tap the copper district. In about six weeks, it is expected, the whole nine miles will be graded, and this completed no time will be lost in the construction of the new mill.

Centennial Mining Company.—Last week the Osceola amygdaloid lode was struck in the Centennial cross-cut about 795 ft. east of the Calumet conglomerate. That is, 45 ft. further east of the conglomerate than it was found in the Calumet cross-cut. The lode where struck is poor. With such strong and persistent qualities in the neighboring mines—Calumet & Hecla, Tamarack and Osceola—and showing increased richness in mineral with increased depth, it is strange indeed, if the belt should turn out valueless in Centennial, says the Lake Lenden "Times." But the fact should not be lost sight of that the Osceola lode is very bunchy. When the footwall is reached very likely drifting, both north and south, so as to give it a fair trial, will be continued. Until the belt is fairly opened on no accurate idea of its value can be formed.

Central Copper Mining Company.—The openings in the mine do not at the present time appear to be looking promising. For the last few months the product of the mine has fallen off somewhat from the monthly output during the first three or four months of the year. Under the circumstances it has been necessary to reduce the force on the surface at the rock yard and the stamp mill.

Franklin Mining Company.—This mine produced 175 tons during June, against 151 tons for May and 190 tons for June, 1892. This makes 1,062 tons produced since January 1st, against 1,191 tons last year; a decrease of 129 tons.

Huron Mining Company.—The output of June was 52 tons.

Quincy Mining Company.—During June, this company produced 700 tons of copper and 1,215 lbs., as against 700 tons, 1,535 lbs. for May, a difference of only 320 lbs. for the two months; and 500 tons in June, 1892. This makes 4,140 tons produced for the six months, against 3,002 tons last year: an increase of 1,138 tons.

Tamarack Mining Company.—Commenting upon the fact that shares are now selling at $140, against $160, one year ago, the Calumet "News" says: The mine itself looks better than it has at any time during its existence. No. 1 shaft is now down to the 17th level, which gives quite an amount of ground opened ahead. The Osceola lode, which was struck by this shaft in the neighborhood of the 14th level, is looking well. The drift on the conglomerate, at the 15th level, is reported as looking well. No. 2 shaft, which is down to the 18th level, has just gone through, or has nearly done so, the Osceola lode, which shows up well at this point. The incline winze, on the conglomerate, from the 17th to the 18th level, is in rich ground, more so in fact than has been encountered in any other part of the mine.

MINNESOTA.

Iron—Mesaba Range.

(From Our Special Correspondent.)

The Canton mine, owned by the Minnesota Iron Company, has shut down for a time, throwing 100 men out of employment.

The report circulated here that the so-called Rockefeller interests in the Mesaba—that is, the Merritt mines and railway, and the Lake Superior, McKinley, Shannon and Adams mines—were arranging a combination of interests with the Minnesota Iron Company is utterly without foundation, so far as your correspondent is able to learn.

Mesaba.—Shipments to July 15th, about 55,000 tons. Several new mines on the Mesaba are opening for shipping, notably the Hale, Berringer, Missabe Mountain and Commodore. The Hale loaded its first ore Tuesday, when 10 cars were filled in seven hours. The ore is shoveled into shallow boxes direct from the body, raised by overhead conveyors and carried to chutes over the cars. It is claimed that after the machinery is working well, 600 tons can be mined and loaded every day by 30 men, day and night. The Berringer, one 40-acre tract of the Biwabik, has begun loading with a steam shovel. At the workings of the Biwabik Ore Company, 2,100 tons were mined and loaded on cars by one steam shovel in 10 hours this week. As there is track room for only one ore car beside the shovel, as much time is spent in putting in and getting out cars as in mining and loading. The Missabe Mountain begins mining and loading by shovel next week. The Commodore's first cargo went over the ore docks Thursday.

Minnesota Iron Company.—This company has found a good quality of ore in Section 19, township 58-19, on lands it is exploring.

Mountain Iron Mine.—At this mine 20 cars of ore were loaded, averaging 26 tons to the car, in two hours one day this week. The ore was mined with steam shovel direct from the ore body. This ore is averaging very heavy. Of 40 cars in one train the average was 63,000 lbs. per car, though the cubical contents per car are supposed to be 50,000 lbs.

Iron—Vermillion Range.

(From our Special Correspondent.)

Total ore shipments for the season from the Vermillion range to July 13th were 336,500 tons.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, July 17.

We are again compelled to report a quiet week in the mining operations of this lead and zinc belt, due to the coal miners' strike and the low price of ore. According to reports of one week ago it seemed probable that the coal miners and operators would come to terms of settlement, but there are now no hopes of an agreement being reached. The sales of zinc ore from the different camps were light and made by but few companies, and prices ranged from $18.50 to $20 per ton. Lead ore ruled at $18.50 per thousand, with but little prospects of an advance. Following are the sales from the different camps: Joplin mines, 1,144,910 lbs. zinc ore and 267,950 lead, value $15,541; Webb City mines, 88,700 lbs. zinc ore and 12,680 lead, value $1,010; Carterville mines, 1,330,230 lbs. zinc ore and 82,290 lead, value $13,790; Zincite mines, 5,650 lbs. lead, value $113; Oronogo mines, 25,430 lbs. lead, value $445; Alba mines, 88,000 lbs. zinc ore, value $845; Mosley mines, 265,760 lbs. zinc ore, value $2,126; Granby mines, 480,170 lbs. zinc ore and 29,100 lead, value $4,307; Galena, Kan., mines, 950,000 lbs. zinc ore and 145,000 lead, value $10,660; district's total value, $48,837; Aurora, Lawrence County, mines, 713,890 lbs. zinc ore and 84,910 lead, value $6,437; lead and zinc belt's total value, $55,274.

MONTANA.

Deer Lodge County.

Granite Mountain Mining Company.—Orders have been received to start up this property on half time.

Hope Mining Company.—This company informs us that its mill is now running by water power, and also that it has no intention of closing down its mine, even if silver should drop to 60 cents per ounce. The company paid on July 1st a quarterly dividend of 25 cents per share, amounting to $25,000, and making the total amount paid in dividends up to date $483,252.

Jefferson County.

Leo Mining Company.—The ore in the cross-cut is said to run 104 oz. silver and 7% copper. The mine is said to be in a better condition than for a long time past.

Lewis and Clarke County.

Mountain View.—This and the Montana claims, at Marysville, have been bonded to J. W. Morss, of Boston, for $40,000, and will be developed.

Meagher County.

Cumberland Mining Company.—According to the Great Falls "Leader" Mr. J. Kennedy Tod, of this city, invested in this property on the strength of a report that the property contains 50,000 tons of high-grade ore. Mr. Tod then furnished the company with $45,000 working capital, which it was estimated would insure profitable working. The ore body was found, however, to contain only 7,000 tons, and Mr. Tod became disgusted to such a degree that he refused to invest any further sums or to push the construction of the railroad, and in addition attached the ore on the dump of the mine for the money advanced. The Bank of Castle, which was also a creditor of the company, took the case to the courts, which dissolved the injunction on the ground that Mr. Tod was secured by holding bonds of the company. A receiver was appointed, and then Mr. Tod sold his bonds and brought a new suit, which is still in the courts. The mine is said to owe $140,000.

Moulton Consolidated Mining Company.—As a result of a visit to this company's mine, of several of the stockholders and directors, Mr. P. Harrison has been given a contract to sink a sump in the Moulton shaft 15 ft., and also to cut a station at the 100-ft. level and then cross-cut to the vein. Mr. Harrison has finished his contract of sinking 100 ft., and will start in at once to put in the sump and station. The company has already made arrangements for a large ore house and for the building of a road from the park to the mine. As soon as the cross-cut is finished and the quality and quantity of the ore body is known at that depth the company will take hold of the ore body and develop it. It is expected to have the road and ore house ready by the time the cross-cut is finished, when they will commence shipping ore to the smelter.

Missoula County.

Iron Mountain Mining Company.—This company has declared a dividend of 3 cents per share, which was payable on the 10th inst.

Silver Bow County.

Black Rock vs. Niagara Mining Company.—The plaintiffs in this case are suing for $142,000 which they allege is two-thirds value of the ore extracted by the defendants.

(Reported for the "Engineering and Mining Journal.")

The Lexington mill is shut down for the first time since it started, nearly 11 years ago. Thirty to forty miners are working on tribute, the superintendent, C. C. Ruger, having given married men a chance to support their families.

The Moulton mill has also closed down, for the first time in 12 years. Nothing is being done at the mine except repairing of the shaft. Both the Alice and Silver Bow mills are shut down. The fact is there is not a stamp dropping in the county, and the sampling works have ceased buying silver ore. The copper mines are running along as usual, with the exception of the Anaconda, which has discharged a number of its men. The Butte, Anaconda & Pacific Railroad, which is projected by the Anaconda company, has met with some opposition in being refused right of way over lots owned by real estate agents. This road is liable to have difficulty in connecting with the ore chutes and mines of the Anaconda company, as at present the Montana Union has these connections.

Mr. F. A. Heinze, who has been operating the Con Sullivan mine, in Park Canyon, under a lease and bond, quit work before unwatering the property.

NEVADA.

(From our Special Correspondent.)

Mining assessments falling delinquent during the month of July aggregated $199,800.

Eureka County.

(From our Special Correspondent.)

Diamond Mine.—The water level was struck near the 450-ft. point below the tunnel level, or about 1,200 ft. below the surface. Heavier machinery will be required for deeper working.

Eureka & Palisade Railroad Company, Eureka.—During the month of June this company received in transit to Salt Lake and San Francisco, 2,973 tons of ore, as follows: From Eureka District: From the Diamond mine, 1,790 tons; Eureka oConsolidated Mining Company, 300; Richmond Consolidated Mining Company, 139; Hamburg mine, 102; Delaware mine, 72; Dunderberg mine, 68; Jackson mine, 59; Silan Connor mine, 44; Phenix mine, 31; Bullwhacker mine, 31; Sundries, 29; Pioneer mine, 18; Ethel mine, 12; Rescue mine, 12; Lincoln mine, 11; Idaho mine, 11; Needle mine, 3; total Eureka District, 2,732 tons. From White Pine County, 239 tons, and from Nye County, 2 tons, very rich ore.

Eureka District.—The sudden fall in silver near the last of June has completely paralyzed the mining industry in this and adjoining counties. The Diamond mine, in Eureka District, was closed down, and over 100 men discharged. There are now six men employed there, solely for the purpose of keeping the mine in repair. The Eureka Consolidated and Richmond companies will hoist ore for their tributers for two or three weeks, and if there is not a great improvement in the silver market will (so they say) close down entirely. The lessees and tributers in other parts of the district talk of cleaning up and resting until they can rely on getting reasonably compensated for their products.

Lincoln County.

The reduction works, at Bullionville, which were erected at a cost of $250,000, was destroyed by fire on the 2d inst. The insurance is said to be $30,000. There is no probability that they will be rebuilt.

Storey County.

Consolidated California & Virginia Mining Company.—Owing to the Fourth of July, only three days' work was done during the past week. During this time the mines yielded 185 tons of ore, the car sample of which was $38.12 per ton; 204 tons assaying $28.15 per ton by battery sample were worked. On the 1,500 level a winze from the southwest drift has been sunk 5 ft. in quartz and narrow seams of ore assaying $20 a ton. On the 1,600 level, bulkheads are being put in to control the flow of gas from the old stopes. During the month of June only 1,340 tons of ore were milled, yielding a gross bullion product of $33,319.31. The average battery assay was $27.93 per ton; the average car sample was $30.67.

Potosi Mining Company.—According to the last weekly report, 559 tons of ore was sent to the mill during that period. The same quantity was milled with an average battery assay of $30.98, and an average car sample assay of $29.17.

Storey County—Comstock Lode.

(From our Special Correspondent.)

The pay-rolls of the several mining and milling companies for June footed up $93,319, as compared with $101,172 disbursed in May.

Hale & Norcross Silver Mining Company.—The motion to dismiss the noted suit of M. W. Fox vs. the directors of the company and others, came up for hearing before the Supreme Court on a motion to dismiss, as the defendants had not complied with the requirements of the law in filing points and authorities. The law is simple, plain and straightforward in its rules and ruling on these points, and the facts in detail have already appeared in the "Engineering and Mining Journal." The Supreme Court of the State, however, has denied the motion.

Potosi Silver Mining Company.—The monthly bullion statement for the month of June shows that there was worked at the Nevada mill 2,644 tons of ore, the gross product in bullion being $47,492; cost of reducing, $15,864; net proceeds in bullion, $31,628; assay value of ore per ton, $25.59; gross value per ton, $17.96; net average per ton, $11.96. The mill worked 70%. A shipment of bullion has been received valued at $19,650 in gold.

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, with the car and battery assays, bullion shipments, etc.:

Mines.	Tons H'st'd	Av Car S'mple Assav.	Tons Mil'd.	Av. Batt'ry Assay.	Bullion for Week.	Bullion shipped.
C. C. & Va.	185	38·12	204	28·15	.....	33,319·31
Justice....	.....	.....	147	18·50	.....	.....
Occidental	[1]45	.....	.....	.....	.....	.....
Potosi.....	559	29·71	559	30·98	.....	[2]773 lbs.
Savage ...	[3]131	28·29	200	.....	.....	3,960·00

Only three days' work during the week owing to the holidays.

[1]Good grade ore. [2]Crude bullion. [3]Cars.

White Pine County.

(From our Special Correspondent.)

Silver mining in this county since the late heavy drop in the white metal has come to a standstill: day's-pay men are all discharged as far as heard from. There is not a silver mine in the county that will pay to work under any circumstances with silver below 80 cents per ounce, and there is no profit at that figure.

White Pine District.—The following shipments of ore are reported for the month of June. From Zoanni Brothers, 99 tons; C. A. Mathewson, 68 tons; Rocca Kragnazo, 58 tons, and J. Minolette, 14 tons; total, 239 tons.

NEW MEXICO.

Grant County.

(Reported for the "Engineering and Mining Journal.")

The mines in the vicinity of Pinos Altos in themselves controvert the statement sometimes made that New Mexico contains no fissure veins, for these have been worked for many years, and to a considerable depth. The district is situated 90 miles above the Mexican boundary, and is within seven miles of a railroad. It is favorably situated for economical mining, as there is timber in abundance. Wood costs from $2.50 to $3 per cord and lumber from $18 to $20 per 1,000 ft. The mines are accessible to wagon roads and the climate is salubrious. The altitude is 7,000 ft., but there is no snow to interfere with mining. The ores are gold and the veins run generally little east of south through diorite or granite. The Pacific mine, owned by the Pacific Gold Company, of St. Louis, and Messrs. Bell & Stevens' property are the most extenisvely developed mines in the camp. This bornier mine was first worked as early as 1860, and, with the exeeption of a few years, almost continuously since. It was closed down when base ore was struck at a depth ranging from 40 to 110 ft. It is thought that this ore could not be treated, but nowadays no difficulty is found in treating it with plate amalgamation and concentrating the iron pyrites, zinc blend and galena, which the ore contains, on Frue vanners. This vein is worked for a distance of a mile and a half. On the Pacific mine the drifts extend the full length of the property and the main shaft is 360 ft. deep. In the Bell & Stevens claim there is a tunnel running from the south line the full length of the claim, which is connected with the main tunnel of the Pacific Gold Company. The property has four shafts connected with the main tunnel and has 200 ft. of ground below their lower working ready for stoping. There are two hoists on the property and all proper conveniences for cheap extraction. North of the Pacific Gold Company's mine is the Aztec. This property has a tunnel connected with the Pacific workings and which runs 500 ft. north on the vein. A cross-cut tunnel is being driven which is now in 730 ft. and will cut the vein within 100 ft. at a depth of 500 ft. from the surface.

Contracts have been entered into to deliver the ore onto the dump at $3.35 per ton from the Bell & Stevens mine, and as this ore is said to have averaged $20 to $40 per ton, it leaves margin for considerable profit. Messrs. Bell & Stevens have a mill at Pinos Altos, 1½ miles distant. The pyrites concentrates are shipped to smelters.

The Mountain Key and Ohio properties are considered the next best developed mines in the camp. The former mine was worked to a depth of 700 ft. The Ohio has a tunnel 600 ft. on the vein connected with a shaft; these workings show a large body of ore and it is estimated that with a chute to deliver the ore on the wagon road grade, 350 ft. below, ore can be placed in the bin at a cost not to exceed $1.50 per ton. The Mina Grande and Kept Woman have been worked for a distance of two miles varying from 20 to 300 ft. deep. A hoisting plant has been put on the property and stoping will be commenced, as well as the systematic opening of the property.

The Pacific No. 2 property is parallel to the Pacific. This property has been worked to a depth of 150 ft. by a tunnel 700 ft. long on the vein. This property is in litigation with the Pacific. Water from the mines of Pinos Altos is used in milling, as otherwise there is a scarcity.

Socorro County.

Ambrosia Mining and Smelting Company.—This company has been organized to work the Ambrosia mine, with a capital of $3,000,000. Its headquarters will be Pueblo, Colo.

OHIO.

Perry County.

Congo Mine.—This mine, near Corning, is owned and operated by H. D. Turney & Co., of Columbus, O., with J. H. Ferguson general superintendent of mines and J. W. Taylor, mine boss. At present the capacity does not exceed 600 tons per day, but they expect by this time next year to have the mine opened out so that they can increase the daily capacity to 1,200 tons. The hoisting apparatus can easily handle 1,400 tons per day. Harrison machines are used in mining the coal. This mine employs in the neighborhood of 150 men. The coal is 13 ft. in thickness, but only 8 ft. of it is worked.

Mine 21.—A correspondent of the Pittsburg "Chronicle Telegraph" writes: This mine is situated on Sunday Creek, about two miles east of Shawnee. It is a machine mine, owned and operated by the Sunday Creek Coal Company, with Fred. Miller superintendent and J. H. Wile, mine boss. The coal here varies from 6 to 8 ft. in thickness and contains as much, if not more, bone coal and slate than the mines of Shawnee. Last spring the company began work on a new opening in the hill opposite the old mine, but after driving in about 60 ft. discovered they had opened in the wrong place and consequently ceased work. They will, however, soon begin work on another opening, which will give employment to a large force of men when in operation.

OREGON.

Baker County

White Swan Mining Company.—A clean-up of a 12 days' mill run amounted to $4,700.

PENNSYLVANIA.

Bituminous Coal.

Ten-Mile Coal Company.—This company has been organized at Brownsville, Pa., by electing Samuel Pearsall, president; J. Holmes Patton, secretary, and Daniel Pearsall, treasurer. This company will develop and operate a large tract of coal recently purchased above Brownsville. It is about three miles square and has a river frontage of one and a half miles.

Washington Coal and Coke Company.—This company, recently formed with a capital of $250,000, has taken 2,000 acres of land from J. S. Newmaver and made him general manager of the company. The officials of the company are as follows: P. G. Cochran, president; J. R. Laughrey, treasurer, and J. H. Wurtz, secretary. In addition to 2,000 acres of coal land, in Fayette County, the company has 450 acres of surface, and 75 completed coke ovens will be turned over to the company. Three hundred additional ovens will be built at once.

Coke.

Dunbar Furnace Company.—The Hill Farm Coke Works, of this company, have been shut down and

the Ferguson Coke Works have been banked. There are 220 ovens in both plants, and 200 men have been thrown out of employment.

Northampton County—Slate.

Bushkill.—The quarry of Miller & Allen is being rapidly developed, and the top ground taken off a section 100×160 ft. A careful examination shows that the bed of slate is 15 ft. thick, and of excellent quality.

SOUTH CAROLINA.

Globe Phosphate Company.—Dr. W. T. C. Bates was chosen president of this company at a meeting held in Columbia, recently.

SOUTH DAKOTA.

Lawrence County.

Seabury Calkins Mining Company.—At the recent annual meeting of this company the old board of directors and officers were elected. Prospecting with the diamond drill will be resumed. It is said that there is a large bed of iron ore in sight, running from $20 to $40 per ton. This ore, it is said, can be worked by the cyanide process.

Welcome Mining Company.—Work is now being resumed by this company, on its property, which had been leased to the Black Hills Milling and Smelting Company.

UTAH.

Salt Lake County.

Stewart No. 1 Mining Company.—This company produced $6,000 in gold from 21 days' run of the mill during the month of June.

Summit County.

Ontario Silver Mining Company.—A sliding scale of wages has been arranged by this company, in which the pay of miners is dependent on the market price of silver. The old wages will be resumed when silver reaches a certain figure. It is said that the Daly company will shortly adopt the same policy.

VIRGINIA.

Allegheny County.

Low Moor Iron Company.—This company has purchased from Frank Lyman, of Brooklyn, N. Y., his interest in the Stack, the Dolly Ann and the Iron Mountain mines, and the blast furnace, at Covington, for $400,000. The payment is made in stock of the Low Moor company, of which Mr. Lyman will now own a controlling interest.

WASHINGTON.

The total shipment of coal from Seattle during June was 15,100 tons, Tacoma shipping 15,360 during the month.

King County.

Eureka Coal Company.—About 14 men are now employed and development work is going on rapidly. There are four veins at an angle of 45°, of 10, 8, 6 and 3½ ft. thickness, respectively.

WEST VIRGINIA.

Fayette County.

Star Coal and Coke Company.—This company has filed articles of incorporation to work coal mines and build coke ovens near Oak Hill, where an extensive tract of land has been secured, adjoining the Chesapeake & Ohio Railroad. The incorporators are J. T. Jones, George W. Jones, William D. Thurmond, Joseph S. Thurmond and L. G. Gaines, all of Fayetteville.

Marshall County.

Carbon Coal and Coke Company.—A meeting of the stockholders of this new company has been held and the following directors and officers elected: President, C. W. Poole; secretary, W. W. Campbell, both of Pittsburg; William C. Dravo, C. W. Pool, W. W. Campbell and J. C. Orr, of Pittsburg; Col. Ben. Wilson, of Clarksburg, W. Va.; A. D. Pierce and J. W. Burchinal, of Moundsville, W. Va., directors. Orders were given to the agents to at once take up the lands which have been optioned and to state to the owners that cash would be paid for all purchases. It was also decided to open mines and be ready to begin work as soon as possible after the purchases are arranged. The lands include about 10,000 acres.

FOREIGN MINING NEWS.

BRAZIL.

St. John del Rey Mining Company, Limited.—The report of the directors for the year ending May 31st, 1893, shows: Cash at bankers, £1,744; also on deposit, £30,000. Balance receivable on bonds and due on shares recently allotted, £6,981 10s. To pay: Drafts running due to July 2d, £7.300. Balance on mills, stores, etc., to be shipped, £16,000. In Brazil, on February 28th, the account stood: Cash, £315; gold for shipment, £2,127; sundry debtors, £1,052. To pay: Sundry creditors, £7.939. The superintendent reports that the time for completion of the reduction plant will be very much later than that given by him in his report for 1892, but he indorses the opinion he has often expressed, that as soon as the whole of the plant is in order, the undertaking will be crowned with success.

BRITISH COLUMBIA.

Kootenai.

(Reported for the "Engineering and Mining Journal.")

Hall Mines, Limited.—These properties, mention of which was made in the "Engineering and Mining Journal" of July 8th, are situated 10 miles by wagon road from Nelson. Nelson is located on the outlet of the Kootenai Lake and Columbia River, and can be reached by boat. To take ore out at present it must be hauled to Nelson and shipped to Bonner's Ferry, Idaho, then transferred by wagon to the Great Northern Railroad, close by, or to the Northern Pacific, 32 miles away. To avoid crossing the boundary line, ore can be taken 28 miles by way of Nelson to Stroals, on the Columbia River, thence by boat 120 miles up the Columbia, then to the Canadian Pacific Railroad at Revelstoke. Our correspondent states that he believes Mr. Roepell, the examining engineer, has overestimated the value of the ore on these properties, which he thought would average 100 oz. silver and 17½% copper.

BRITISH GUIANA.

From January 1st to June 26th, 1893, the exports of gold have been 57,798 oz., worth $1,029,018, against 50,353 oz., worth $898,305, during the same period of 1892.

CHINA.

The "North China Herald" says that the mining engineer engaged by H. E. Chang Chih tung, the Viceroy of Hu Kuang, has reported the finding of silver deposits in the vicinity of Tayenshan, 90 miles from Wuchang, where the large coal and iron mines are in full working order, and employing over 1,000 men a day. Tayenshan is also called Wupaoshan or "Hills containing the Five Precious Metals." As silver and iron have already been found, the Chinese are anxiously waiting for the announcement of the finding of gold, copper and lead to fulfill the prophecy of one of the local sages, who gave the hills of Tayen this appellation.

COLOMBIA.

Tolima Mining Company, Limited.—The estimated profit for June amounts to $33,000. Reports from the mine state that the 120-fathom level west is turning out ore at the rate of $100 per fathom, and the 130 fathom east at the rate of $500 per fathom. This is based on silver at 80c. per oz.

ENGLAND.

On July 4 an explosion occurred at Combs colliery Thornhill, near Dewsbury. At the time there were 147 people in the mine. The Wheatley seam, in which the accident occurred, is 141 yds. deep, and access to it is obtained from the pumping shaft by a cage worked underground by a pneumatic engine. Repeated efforts were made to explore the mine, but the rescuing party did not get beyond the underground office, where the assistant manager was found dead. A few miners have been found, but it is feared that at least 138 were killed.

Delegates representing 248,000 coal miners in various parts of the country met in Birmingham July 19th to consider the proposal of the mine owners to reduce wages 25%, the cut to go into effect on July 28th. After a long and heated debate a resolution was adopted declaring that the conference was opposed to the reduction. No decision was reached on the question of a strike if the mine owners persist in their intention to make a reduction, but decisive action will probably be taken before the conference adjourns. The general opinion is that the Miners Federation will order a strike.

GERMANY.

First Bohemian Zinc Mining and Smelting Company.—A company has been formed under this title, at Breslau, which will work the Halle and Barbara mines at Merklin, and erect smelting works at Staab. Until now the ores of these mines were exported to Upper Silesia, where they were much valued on account of their excellent quality. This will be the first zinc-smelting works ever established in Bohemia. The shares of the company are all taken up; they were not placed in the market at all.

INDIA.

Balaghat Mysore Gold Mining Company.—The June report states that 430 tons were crushed, yielding 292 oz. gold. The lowness of the yield was due to an unexpected pinching of the vein.

Balaghat Mysore Gold Mining Company, Limited.—The third ordinary general meeting of the company was held in London, May 25th. The annual report for 1892 shows 3,780 tons quartz treated, yielding 6,866 oz. gold, against 2,911 tons, yielding 5,196 oz. in 1891. The profits during 1892 was £6,004, as compared with £136 in 1891. Against this profit there were charged: Depreciation of machinery, £1,208; interest on debentures, £1.793; various expenses, £740. Of the remainder, £2.000 was carried to the reserve fund, leaving a net balance of £267. There are now over 40 000 tons of tailings on the dump, and it is proposed to erect a plant to work them.

Mysore Mines, Limited.—The June report states that 4,208 tons were crushed, which produced 4,471 oz. of gold; also 852 oz. were obtained from tailings.

Nundydroog Gold Mining Company, Limited.—During June 2,100 tons were crushed, producing 1,948 oz. gold; 166 oz. were obtained from tailings, making total output 2,114 oz.

Ooregum Gold Mining Company, Limited.—During June 3,305 tons were crushed, producing 5,378 oz. of gold, besides which 3,200 tons of tailings worked produced 929 oz., making the total yield 6,307 oz. gold.

South East Mysore Mining Company, Limited.—The directors in their annual report state that a large amount of development work has been carried out, but so far without any favorable result. Reports continuing unfavorable, they came to the conclusion that it would be unwise to continue the further development of the lode, but before suspending operations requested Captain Rowe, the manager of the Champion Reef Mine, to make an inspection and report. Captain Rowe advised the continuance of the crosscut at the 500-ft. level east, with the object of intersecting what was presumed to be a lode, indicated by old workings, running in close proximity to the eastern boundary of the company's ground. This work was carried out, and on June 12th a cablegram advised the cutting of the lode, which, at the point of intersection, was of no value. This will be driven on for a short distance, and unless an improvement is manifested very soon all mining work will be discontinued. The company has a reserve of uncalled capital amounting to £4,465 besides a quantity of machinery, and the directors have negotiated to acquire from the Goldfields, of Mysore, a property at the southern end of the Colar field, known as the Yerrakonda Block, comprising about 296 acres.

MEXICO.

Chiapas Mercury Company, Limited.—During June 565 tons of ore were crushed, yielding 23 tons concentrate of an average assay value of 7 oz. gold, 58 oz. silver and 44% copper.

NEW SOUTH WALES.

New gold and tin placers have been found at Burra Burra, which have caused a certain amount of excitement. The depth to pay gravel is 31 ft; its thickness 12 in. and width 15 ft. According to Chief Inspector of Mines W. H. J. Slee, the gravel will probably be pockety and not continuous.

Block No 10 Mining Company.—The eleventh half-yearly meeting of the shareholders in the above company was held in Melbourne, May 5th. The report and balance-sheet contain the following items: "The net profit for the half year is £70,427, to which is to be added £30,016, balance brought forward from last half-year, making a total of £150,443. Out of this three dividends of 2s. 6d. each per share (£37,500) and three of 1s. 6d. per share (£22,500), or a total of 12s. per share (£60 000), have been distributed among the shareholders leaving a balance of £30,443 carried forward for the next half-year. The amount distributed among the shareholders since the formation of the company is £5 9s. per share (£545,000). The current assets of the company as shown in the balance-sheet are £102,910, from which must be deducted the outstanding liabilities amounting to £1,165. The gross tonnage of ore raised during the half-year was 7,883 tons, returning a net amount of £97.316, or an average, after deducting smelting charges and railway freight, of £12 6s. per ton. The working expenses for the period amounted to £106 517, and the gross profits £75,384.

British Broken Hill Proprietary Company.—Owing to the loss caused by the fall in value of silver, the Board of Directors has decided to stop all smelting operation for the present and to discharge the force in that department. Exploration in the mine will be continued, and fluxing ores will continue to be sold on the spot.

Junction Mining Company.—It is reported that this mine on the Barrier Range has made a contract for the sale of some 100,000 tons of sulphide ore through an English company.

Mount Stewart Lead and Silver Mining Company.—The fifth half-yearly general meeting of this company was held in Sydney at the beginning of the month.

The profit and loss account, after allowing for depreciation in plant, etc. (£523), and deducting the first dividend of £2.500, shows a credit of £6,816. The sum of £1,114 was spent in prospecting during the half-year. The directors' report stated that the furnace was shut down on account of there being an insufficient quantity of oxidized ore with which to continue smelting, but it is not to be assumed that there is no more carbonate ore in the mine. There are, it is estimated, about 6,800 tons of dry ore at grass and in sight, averaging about 18 oz. silver per ton, which cannot be treated in the furnace, but will have to be treated by some other process, probably lixiviation. The directors are now instituting inquiries and having experiments made as to the best method of treating these dry ores. The chairman explained at great length what work had been done during the half-year, and said the directors had suspended all operations in order to conserve the funds until the new treatment was decided upon.

Hillsgrove Antimony District.

At the Eleanora mine two furnaces turn out about 10 tons of crude antimony per week. The full battery is working average stone. The concentrates amount to 4 tons. At Baker's Creek the battery is working full time. The management have decided to continue taking the bulk of the crushings from the Big reef and have let a contract to extend the south drive in No. 8 level 100 ft. At the Sunlight stoping is being done at the back of No. 3 level. Five head of the battery have been crushing for the company and 20 for the tributors. At the Consolidated the tributors are getting good ore from the Primrose workings. The tributors are keeping 20 head going at the battery. The tributors in No. 2 continue prospecting. They have 7 tons of ore at grass showing gold. In the Sunlight West reef the drive east from the bottom level is in 70 ft., on payable stone. The winze is down 63 ft., on ore of payable quality. Twelve tons of antimony have been

sent away; there are about 8 more at grass. At the Hillgrove smelting works two furnaces are going. They have 20 tons of crude antimony on hand. They have discontinued driving from the main shaft. The tributors are sinking Smith's shaft and getting splendid antimony. At the Garibaldi mine the usual work is going on.

NEW ZEALAND.

Blue Spur Mining Company.—One of the largest blasts that has taken place in New Zealand with roburite was made recently at this company's mine. A tunnel was driven into the face of the cement 36 ft., from which two drives were made measuring each about 30 ft., in the ends of which were deposited 700 lbs. and 300 lbs. of roburite respectively. These charges were detonated with electric fuses connected with the dynamo. The face of the cliff was about 76 ft. high, and the surface operated on extended about 150 ft. The manager estimates the cement dislodged by the explosion at 22,500 tons. On examining the ground above the cliff enormous fissures were found, extending back to a distance of nearly 80 ft, and it is expected that when the present dislodged mass is removed, fully 25,000 tons more cement will be available without any further blasting.

NOVA SCOTIA.

The Cape Breton coal syndicate has put out $21,000,000 in securities. The stock issued amounts to $18,000,000, and besides this a loan of $3,000,000 secured by mortgage has been obtained. The actual purchases made by the syndicate represent an expenditure of $2,500,000.

QUEENSLAND.

Charters Towers District.—The "Australian Mining Standard" gives the following concerning this district: The Brilliant Central has 50 tons of ore out. It has between 300 ft. and 400 ft. of backs on the reef now giving good returns in Kelly's Queen Block. A rough clean up from the latter of 260 tons gave 478 oz. of gold. A rough cleaning from the Brilliant of 700 tons gave 828 oz. of gold. A third dividend has been declared, equal to £3,125. A dividend of 6d. has been declared in Kelly's Queen Block, equal to £1,200. The Victory crushed 540 tons from the No. 2 shaft Brilliant for 2,768 oz.—5 oz. per ton; 80 tons from No. 1 shaft of 133 oz.; the fortnight's yield being 720 tons for 2,902 oz., worth over £10,200. A dividend of 9d. has been declared, equal to £7,500. The total dividends from this mine for April and May were £47,500. Mills' United crushed for the fortnight 1,073 tons for 2,340 oz. of gold. The usual dividend of 3d. was declared, equal to £3,750. The Victoria crushed 130 tons of stone for 471 oz. Brilliant St. George cleaned up for 460 oz. gold. A dividend of 3d., equal to £1,800, was declared.

SOUTH AFRICA.

Namaqua Copper Company, Limited.—The report for the year ending December 31st, 1892, shows, for the first time in the history of the company, a loss on the year's working. This was caused by a decrease in the output of the mine, owing to a considerable falling off in the value of the ore body in the different levels. The average quality of the ore obtained from the mines has been about the same as last year, but lower than in previous years, while the price of copper was low. The returns for the year were 1,623 tons of 21 cwt., and the average price obtained was a fraction under 9s. or $2.16, per unit. The year's work resulted in a loss of £9,895, which, after deducting the balance of £2,745 19s. 7d., brought forward from last year, leaves a sum on the debit side of £7,149.

Griqualand West.

De Beers Consolidated Diamond Mines, Limited.—A dividend of 12½c. for the six months ending June 30th has been declared. The revenue for the financial year ending June 30th was £3,380,000, and the expenditure £1,179,000, leaving a gross profit of £2,201,000, and after providing for interest, sinking fund on debentures and all other expenses a net profit of £1,673,000 remains out of which two dividends of 12½c. were declared, absorbing £1,000,000.

Transvaal—Witwatersand.

According to the special circular of the South African Mining Investors' Agency, boring for the deep level reefs was commenced in October last on claims about 4,000 ft. south of the Simmer & Jack Gold Mining Company's property. The south reef has been struck at a depth of 2,343 ft. deep; at this depth the ore body was 13 in. wide and the drill cores gave assays of $23.48 per ton; at 2,391 ft. the main reef was struck, and at 2,399 ft. the drill was still in reef matter. The cores from this depth had not been assayed at last accounts, but gold was visible. The details of boring show the dip in the strata has gradually decreased with depth, and at the lowest point the reef is about 16° from the horizontal. At 400 ft. the dip was about 50°, at 1,000 ft. 45°, and at 1,800 ft. 22°. Numerous beds of banket were intersected by the drill at various depths, some of which were auriferous, but none to a paying extent.

THE STRAITS.

Pahang.—Late reports from Singapore state that the prospects of gold mining in this protected state have much improved since the suppression of the disturbances there. Regular monthly crushings are now being made at the gold mines, and although the operations are on a very small scale the yield of gold is, in each case, paying the expenses of mining. The latest news from the Rant Australian Mining Company, operating here, is to the effect that the latest crushing amounted to 850 tons of quartz, producing 1,100 oz. of gold. The Pahang government, by the terms of its mining leases, takes a royalty of 5% on all gold produced, a source of large revenue.

URUGUAY.

An official report upon the goldfields of this country shows no encouraging features. It is stated that in 1888 gold to the value of £2,600 was produced, which increased to £18,200 in 1891, but fell to £10,700 in 1892. None of the companies have paid a dividend.

Gold Fields of Uruguay, Limited.—During June 700 tons were crushed, producing 188 oz. of bullion, worth $2,550.

VENEZUELA.

Quebrada Railway, Land and Copper Company, Limited.—The accounts for the year ending December 31st, 1892, show that the working, after meeting interest charges, resulted in a loss of £66,905; against this there was a balance brought forward from the preceding year, £7,374, leaving a debit of £19,531.

WALES.

Universal Coal Company.

This company has commenced sinking operations in the Aber Valley, and the pit, one of the largest in South Wales, measuring 18 ft. 6 in. inside the brickwork, has already been sunk to the depth of 60 ft. As soon as the masonry work is completed it is expected a second pit will be commenced, and sinking operations will be carried on at both pits until the coal measures are reached. The company is also opening a large quarry in close proximity to the colliery. It is also stated that land has been taken in which to sink another pair of pits to the lower measures, some distance below the Universal company's undertaking.

Rhymney Valley Coalfield.—Several important developments are in progress in this important coalfield. The Rhymney Gilvach pit is opening out in the Brithdir seam, with its excellent roof, and will soon find employment for a number of fresh hands, according to the "Iron and Coal Trade Review." The Llanbradach pits, five miles farther down the valley, are also commencing to work coal. At New Tredegar the Powell Duffryn company is proceeding rapidly with the development of its property. A washing apparatus has been put up—one of the largest in the county—for dealing with small coal. There are also a number of coke ovens of a modern type for converting the surplus small into coke. The new sinking of this company, which was inundated about a year and a half ago with a copious inflow of water from the Millstone grit, which then seriously threatened the prosperity of the valley, is now completely under control.

COLORADO ORE MARKET.

Denver. July 15.

(From our Special Correspondent.)

For the two weeks ending July 15th the receipts of ore in this market by the public samplers have been very light, and on account of the unsettled condition of silver, and business generally, there have been no ores offered for competitive bid. Probably 20 cars of gold ores (principally from Cripple Creek) and some cars of copper ore have been sold at private sale at fair prices. One of the smelters is now looking for some gold quartz ore and another looking for a few hundred tons of lead, both requiring these products to help them smelt up their stock of ores on hand. With these two exceptions, the local market is, for the present, dead.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 94, 95 and 96.]

NEW YORK, Friday Evening, July 21.

In our last issue we stated that in the dividend-paying mines there had been only five transactions, and under non-dividend paying mines but four. This week the report is even more discouraging, there being only one sale of a dividend-paying stock, namely, 110 shares of Ontario at $9 on July 15th, and two sales in non-dividend-paying stocks, namely, 100 shares of Alpha at 20c. and 100 shares of Overman at 30c. The depreciation of silver has killed mining stock transactions, no one wishing to buy, not even where silver does not enter the transactions. This is curious, to say the least, as the influences which have depressed silver mines should have raised the price of purely gold mining stocks, owing to the fact that gold then actually appreciates in value.

There has been a somewhat improved inquiry for Deadwood-Terra and Caledonia, but we have no sales to report.

The Hope Mining Company reports that it is now running by water power and that there is no intention of closing down the mine, even although silver should drop to 60c. per oz.

Horn Silver is now producing about 1,000 tons per month, against 1,500 tons as formerly, and the force has been reduced to 70 men, whereas 100 was previously employed. In the course of two weeks the company will issue a statement which will show a gain of about $10,000 to be added to the surplus.

Boston. July 20.

(From our Special Correspondent.)

The depression in the market for mining stocks continues and prices touched a lower level this week than we have seen for many years. The speculative list has, of course, felt it most, as many of them have been bought on margins and holders have been compelled to liquidate, but even the investment stocks have been pressed for sale in order to obtain needed funds resulting in lower quotations. Calumet & Hecla, for instance, which has withstood the depression fairly well, was sold down from $275 to $259 this week, with only a rally to $260, and Tamarack, which sold last week at $139, dropped to $128.

Boston & Montana has been very freely raided and records the lowest price in its history, viz., $15½, a decline of $1½ from the closing price of last week. We learn that the syndicate to take the new issue of stock at $22½ is taking the stock, thus showing their faith in the future of the company and its ability to resume payment of dividends when the conditions are more propitious.

Butte & Boston has ruled quiet and steady at $5¼ to $5¾: very little of this stock is pressed for sale and at present prices it looks as if the bottom had been reached.

Osceola recovered in part the loss of last week and advanced from $20¾ to $23½, and closed at $23. This is considered very low for the stock, as it is stated on good authority that even at present rates for copper the company can earn $2 per share and have a fair surplus.

Centennial has been the subject of much gossip the past week. A report, purporting to come from the mine, that the lode on the Osceola vein had been found very rich, started a covering by the shorts which carried the price up from $2½ to $4⅛. Later, when the report was contradicted and a private dispatch was received stating that the mine was shut down and all work suspended, the price dropped to $2, at which it closed to-day.

Quincy sold at $102 and declined to $100.

Franklin sold at $9¼, and later at $9⅜, for small lot.

Kearsage declined from $5½ to $4¾, rallying to $5⅛.

Atlantic sold at $7¼ and declined to $7 on small transactions.

Wolverine declined from $1¼ to 75 cts.

A sale of 10ths Ontario Silver is reported at $9¾.

3 P. M.—Boston & Montana declined this afternoon to $16¼, but rallied at the close to $17.

Centennial sold at $2 as before, and Quincy declined to $98 for two shares.

$255 was best bid for Calumet & Hecla, and $125 for Tamarack.

San Francisco.

SAN FRANCISCO, July 21 (*By Telegraph*).—The opening quotations to-day are as follows: Best & Belcher, 60c.; Bodie, 10c.; Belle Isle, 10c.; Challar, 35c.; Consolidated California & Virginia, $1.25; Eureka Consolidated, $1; Gould & Curry, 35c.; Hale & Norcross, 10c.; Mexican, 40c.; Mono, 10c.; Navajo, 10c.; Ophir, 70c.: Savage (assessment delinquent of 25c. per share), 40c.; Sierra Nevada, 45c.; Union Consolidated, 35c.; Yellow Jacket, 50c.

London. July 12.

(From our Special Correspondent.)

The record of the past week in the stock markets is a curious mixture of gaiety and anxiety. Never before in the remembrance of city men was the town given up to such gala times as it was during the days preceding and following the royal wedding. On Wednesday, Thursday, Friday and Saturday, July 5th to 8th, no business was done, and the streets were rendered impassable by sightseers. Transactions on 'Change were of course very much restricted, and most members were gravely anxious about the outcome of the settlement which took place on Wednesday, the 12th. This settlement proved as awkward a time as that in the middle of May, and more than one house of the highest character has gone done in the squeeze. The consequence of these two contradictory influences is that very little in the way of regular business has taken place during the past seven days.

Of course the silver question still occupies the attention of all who deal in American mining stock. I was able to report last week that a slight rally had taken place in the value of these stocks after the severe slump of a fortnight ago. This advance has since been lost, so that the shares are down again. Elkhorns are 10s. 6d.@11s. 6d.; Jay Hawks, 6s. 6d.@7s. 6d.; De Lamars, 15s @17s. 6d. Poormans have sunk down to 5s. 6d.@6s. 6d.—a trifle lower than after the first sudden slump. This may be accounted for by the fact that sellers have been in the market since the consolidation of the Poorman with South Poorman and the Idaho Milling Company. Another dividend-paying mine that has fallen severely in value is Maid of Erin, which is now quoted at 2s. 6d.@7s. 6d., as against 7s. 6d.@10s. a week ago. Non-dividend payers are sinking in every direction.

The Big Creek Mining Company, working antimony mines in Nevada, reports that it has practically closed down on account of the exceedingly low price of antimony. Only enough is now taken out to supply two regular customers. The quotation of their stock on 'Change here is lower than a month ago, but it is pretty much a nominal one.

The Harquahala Gold Mining Company, lately formed by the promoters of Elkhorn and De Lamar to work a gold property in Arizona, has already commenced active operations, the mill having been

started July 8th. Mr. Theodore Allen, late assistant at the De Lamar mines, has been appointed manager and is now at the mines.

The Jackson Goldfields, Limited, which I mentioned a few weeks ago as having been registered in London as a company to work gold properties in California, turns out to be nothing but the old Amador under a new name. The Amador mine was acquired a few years ago by the London company from a promoter who, it is alleged, forged the power of attorney of the owners, and three months ago the decision of the State Court of California enabled the sheriff to sell the property at the owner's orders. By the law of California it is within the power of anyone to redeem a property thus sold before the expiry of the sheriff's sale. The Amador property has therefore been reorganized, new shares allotted and the property bought back. In addition to this the Amador Queen claim and the milling plant have also been acquired. On this reconstruction no prospectus whatever has been published, and it is impossible to obtain information except by hearsay. The Jackson Goldfield is quoted on the Stock Exchange, but nowadays that is no criterion of the character of the stock.

The third annual meeting of the American Belle Mines, Limited, was held July 11th. The report for the year 1892 showed a loss of £13,000, as compared with £10,000 the year before. The meeting would have been held earlier in the year, but for the fact that the directors desired that the shareholders should have an opportunity of hearing an account of the property by Mr. F. P. Crowther, one of the directors, who has lately been visiting the mine. The information given by Mr. Crowther led one to believe that he considers the National Belle Mine to be a promising property. After the publication of this report for 1892, the shares of the American Belle fell considerably on 'Change, and now stand at 1s.@ 1s. 6d.

DIVIDENDS.

Quincy Mining Company, dividend No. 50, of three dollars per share, $150,000, payable August 15th, at the office of the company, in New York City. Stockholders in Massachusetts will be paid at the office of N. H. Daniels, No. 35 Congress street, Boston, Mass. Transfer books close July 22d.

MEETINGS.

Mountain Tunnel Gravel Mining Company, at the office of the company, 219 Sansome street, San Francisco, Cal., July 27th, at 1 p. m.

Wolverine Copper Mining Company, at the office of the company in New York, August 7th, 12 o'clock noon.

METAL MARKET.

NEW YORK, Friday Evening, July 21.

Prices of silver per ounce Troy.

July.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.	July.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in $1.
15	4·83	33⅝	72¼	0·559	19	4·83½	33	70½	0·545
17	4·84	33¾	72¾	0 563	20	4·83	32¾	70½	0·545
18	4·84¼	33½	71½	0 553	21	4·83¼	32⅝	69½	0 537

Shipments abroad have been very large, sellers finding they can do better with London than with Washington, the policy in Washington seeming to be how not to buy silver. As the result of this action tendency of silver is still declining.

The United States Assay Office at New York reports the total receipts of silver for the week to be 117,000 ounces.

Gold and Silver Exports and Imports at New York, Week Ending July 15th 1893, and for Years from January 1st, 1893, 1892.

	Gold.		Silver.		Excess of
	Exports.	Imports.	Exports.	Imports.	Exports.
Week....	$2,800	$968,415	$910,291	$38,123	*
1893.....	68,877,642	8,684,804	17,853,586	1,356,345	76,690,079
1892.....	45,254,575	6,548,306	12,141,440	917,965	50,599,202

* Excess of imports, $63,447.

During the week ending July 21st, the exports and imports of gold and silver so far ascertained have been as follows: Exports, gold, $6,000; silver, $736,000. Imports, gold, $933,697; silver, $53,902.

NOTES OF THE WEEK.

Perhaps the most important movement in the money market during the week has been the payment of gold by the Sub-Treasury Clearing House balances and for bankers' checks. The Sub-Treasury has always paid out some gold, but the free payment of gold commenced on July 10th, on which date balances owed the Clearing House and the checks presented by banks received for Clearing House balances were paid in gold coin. The amount of gold coin so paid out amounted to $3,420,000 on Thursday evening, July 20th, and the Sub-Treasury expects to pay not less than $1,375,000 in gold to-day.

A number of reasons have been given for this action by the daily press, but none have given what we believe to be the true one. At present there is but little over $12,000,000 in legal tenders in the Sub-Treasury, and during the month of August Mr. Jordan will be called upon for not less than $25,600,000 to move the crops. The charges for shipping gold are heavy, indeed onerous, and it has been thought best to save currency notes and pay out gold. There are, besides, several other advantages in this action. First of all, the payment of gold by the government tends to renew a much-wanted confidence, and the banks are now following suit after the government, as is evidenced by the receipts of gold by the custom house. Secondly, the gold reserve is kept below the $100,000,000 mark, and while such is the case there can be no further hoarding of gold in the shape of certificates.

The movement in favor of the repeal of the Sherman act continues to grow in strength and there is now no doubt but that it will be repealed at the coming session of Congress. The Chamber of Commerce has been officially informed by various commercial bodies throughout the United States of their action in favor of the repeal of the purchasing clauses of the Sherman Silver Act. The following is a list of the bodies so far heard from: Richmond, Va., Chamber of Commerce; Richmond, Va., Stock Exchange; Norfolk, Va., Merchants' and Manufacturers' Association; Petersburg, Va., Chamber of Commerce; Charleston, S. C., Chamber of Commerce; Savannah, Ga., Board of Trade; Tallahassee, Fla., Board of Trade; New Orleans, La., Chamber of Commerce; Memphis, Tenn., Cotton and Merchants' Exchange; Louisville, Ky., Board of Trade; Providence, R. I., Board of Trade; Cambridgeport, Mass., Citizens' Trade Association; Philadelphia, Pa., Board of Trade; Pittsburg, Pa., Chamber of Commerce; Reading, Pa., Board of Trade; Cincinnati, O., Stock Exchange; Cincinnati, O., Commercial Club; Detroit, Mich., Board of Trade; Elgin, Ill., Board of Trade; Sioux City, Ia., Jobbers' and Manufacturers Association; Milwaukee, Wis., Merchants' Association; St. Paul, Minn., Chamber of Commerce.

In this connection a tabulated statement of replies to questions sent out by the "Literary Digest" to various journals and newspapers throughout the country are of great interest. The principal question asked was: Does your journal favor repeal of the Sherman act? The replies were located as follows:

	Replies received.	For repeal.	Against repeal.	Doubtful.
Eastern States:				
Republican	23	20	2	1
Democratic	14	13	1	..
Independent	24	22	2	..
All others	5	4	1	..
Total	66	59	6	1
Western States:				
Republican	23	21	2	..
Democratic	18	15	3	..
Independent	16	11	5	..
All others	27	5	22	..
Total	84	52	32	..
Southern States:				
Republican	1	1	..	..
Democratic	9	7	2	..
Independent	6	6	..	..
All others	9	3	6	..
Total	25	17	8	..
Grand total	175	128	46	1

The Chief of the Bureau of Statistics reports that the exports of gold from the United States during the fiscal year 1893 ending June 30th ult., amounted to $108,680,844, and the imports to $21,174,381; excess of exports, $87,506,463. During the fiscal year 1892 the exports were $50,195,327, and the imports $49,699,454; excess of exports, $495,873.

The exports of silver during the twelve months ended June 30th, 1893, were $40,737,319, and the imports $23,193,252; excess of exports, $17,544,067. During 1892 the exports were $32,810,359, and the imports $19,955,086; excess of exports, $12,855,473.

For the six months ended June 30th the exports of gold amounted to $73,717,938, an increase of $32,148,788 over the corresponding period of the preceding year. The imports were $11,759,043, an increase of $3,723,435.

The Kansas State Bimetallic Convention met at Topeka, July 20th. The convention adopted resolutions favoring the free coinage of silver and elected delegates to the Chicago convention to be held August 1st.

The advanced sheets of the Bureau of Statistics show the commerce of the United States for the month of June and for the fiscal year ending June 30th to be as follows:

	June, 1893.	June, 1892.	Year 1893.	Year 1892.
Impts.	$75,832,084	$72,016,568	$941,076,128	$827,402,462
Expts.	65,416,367	61,888,337	847,423,147	1,030,278,148
Gold impts.	1,059,682	494,026	21,174,381	49,699,454
" expts.	2,711,226	17,129,503	108,680,844	50,194,327
Silver imp'ts.	1,586,110	2,157,400	23,193,252	19,955,086
" expts.	4,046,394	3,422,565	40,737,319	32,810,559

The Hungarian semi-official newspapers, dealing with the heavy fall in the price of silver, express the opinion that the movement will have no disturbing influence on the operations remaining to be carried out for the reform of the Austro-Hungarian currency. The Minister of Commerce proposes to close the State silver mines of Przibram, in Bohemia, and Kremnitz, in Hungary.

President Grant, of the Omaha & Grant Smelting Works, says: Conditions are not as bad as reported. Our smelters will continue without appreciable curtailment. Many mines will remain open, and there is no real basis for this commercial pause.

Domestic and Foreign Coins.

The following are the latest market quotations for the leading foreign coins:

	Bid.	Asked.
Mexican dollars	$.58	$ 59
Peruvian soles and Chilian pesos	.52½	.54
Victoria sovereigns	4.87	4.88
Twenty francs	3.86	3.89
Twenty marks	4 74	4.78
Spanish 25 pesetas	4.75	4.80

The financial clouds still hang very low all over the country the only brighter spot being New York, where money on call is easier, but, as reported last week, still very scarce as far as the commercial community is concerned. The closing up of so many banks in the West will mean that a normal state of affairs will not there be reached again for a long time to come, and the natural sequence of this will be low prices for several metals for a longer tim than would otherwise be the case.

Copper.—There is practically no market here for this metal, and would-be sellers have therefore to look to Europe, all the markets of which have fairly been swamped with American copper, large sales of which, in lake, electrolytic and casting brands, have been made at prices below the market value here, where prices must be quoted nominally as 10¼ for lake, 9⅞ for electrolytic and 9¾ for casting. Arizona pig, guaranteed 96%, held for 9¼. The exports continue to be very heavy indeed and so far this month amount to more than 4,000 tons. As statistics abroad are cabled to show a decrease of 200 tons in the visible supply, it is evident that deliveries there must have been very large.

The speculative sorts in London have remained very firm as to prices, which show hardly any alteration from last week's close, at £42 15s. for spot and £43 5s. for three months prompt, refined and manufactured having to be quoted as follows: English tough, £46 10s @£47; best selected, £47@£47 10s.; strong sheets, £54 10s.@£55; India sheets, £52 10s.@£53; yellow metal sheets, £4¾.

The following figures give the production, in tons of 2,240 lbs., of copper in the United States and also by the chief foreign mines, and the exports of fine copper from the United States for the month of June, and the six months ending June 30th:

	June.	Six Mos.
Reporting mines in the United States	11,524	62,470
Pyrites and outside sources, U. S.	1,042	6,478
Reporting foreign mines	7,935	41,053
Total, long tons	20,501	110,001
Exports from U. S. (fine copper)	5,1·9	20,361

Exports of copper for June were heavy, the month showing over 25% of the shipments made this year.

The exports of copper from the port of New York during the past week were as follows:

Copper matte:				
Liverpool—Nomadic	3,795 bags	446,516 lbs.		$20,000
" Majestic	2,102 "	247,276 "		11,000
" Aurania	2,179 "	238,069 "		10,000
Copper:				
Genoa—Fulda	90 bbls.	112,500 "		12,375
Liverpool—Majestic	2 boxes	1,300 "		350
" Aurania	1,098 pigs	242,357 "		24,000
Havre—Tancarville	90 casks	112,500 "		12,750
" "	1,736 bars	104,231 "		10,100
Rotterdam—Dubbledam	40 obls.	50,000 "		5,2 0
" Maasdam	67 casks	83 750 "		9,3 0
" "	544 plates	67,203 "		6,874
Hamburg—Rhaetia	90 casks	1 2,500 "		12,000
" Chemnitz	498 bars	33,794 "	}	4,714
" "	9 casks	11 200 "		
" Rugia	189 casks	236,250 "		26,375
" "	820 pigs	112,343 "		13 476
St. Petersburg—Rhaetia	100 casks	125,000 "		13,500
" "	105 cakes	22,099 "		2,400

Tin.—The market has been more settled, prices ruling at from 19⅛ to ¼ for spot, and an eighth of a cent a pound higher for August, while for September there are free buyers at 19⅜@¾. There has been no pressure to sell, but a good many contracts have been closed.

In Europe prices are fairly steady at £82 5s. for spot, and £81 10s. for three months.

Lead.—At the beginning of the week the market was rather firm, but later on sellers came out more freely, the financial troubles being the cause. One sale of about twelve hundred tons is reported to have been made by one of the Colorado refiners at the basis of the New York quotation price of 3·40. No lead is to be had, however, at less than 3½.

Prices in London declined quite heavily, for as soon as the price for Spanish lead reached a figure above £10 more sellers appeared, and the offering of larger quantities had this bad effect. Spanish lead we have to quote at £9 15s., and English at £9 17s. 6d., but may say that whatever lead is offered at these figures is readily taken up.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Owing partly to the continued and unsettled condition of financial matters throughout the country, and the stagnation of trade among pig lead consumers, the demand has been very light in the past week, with only carload sales at 3 25@3·27½c., an occasional car selling at 3·30c.

Spelter.—There are as yet no signs of a termination of the Western coal miners' strike; nevertheless, considerably lower prices have been established, viz., 3 75@·80c. St. Louis, equal to 4@4·05c. New York, galvanizers being as good as closed down. There is a slight scarcity of spot metal.

London quotations are about steady at £17 12s. 6d. for good ordinaries and £17 17s. 6d. for specials.

Antimony.—In this article there is very little doing, either in Cookson's at 10⅝, L. X. at 10⅛, or Hallett's at 9⅞.

Nickel is entirely dormant.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 21, 1893.

Pig Iron Production.

Fuel used.	Week ending July 23, 1892.		Week ending July 21, 1893.		From Jan., '92.	From Jan., '93.
Anthracite.	74	32,000	64	28,860	993,777	935,161
Coke.....	140	127,000	125	121,370	3,797,061	3,735,725
Charcoal...	42	10,700	36	7,845	286,569	260,951
Totals....	256	169,700	225	158,025	5,079,407	4,931,837

Pig Iron.—Opinions seem to differ regarding the pig iron market, some dealers reporting a fair business, while others report lack of demand at ruling prices, and speak of the necessity of either shutting down or lowering wages. Prices have ruled firm, but this has been brought about by the going out of blast of some furnaces. Stocks were somewhat reduced during June, and it is quite likely that they will be further reduced during July.

Pig iron quotations at New York may be put about as follows for Northern brands: No. 1, $14.50@$15; No. 2, $13.75@$14.50; gray forge, $12.50@$12.75. For Southern iron we quote: No. 1, $13.75@$14.75; No. 2 F., $12.75@$13.50; No. 1 soft F., $12.25@$14; gray forge, $12@$12.50—all at tidewater. Scotch irons are quoted: Coltness, $21.50@$22; Eglinton, $19.50@$20; Summerlee, $20.

Billets and Rods.—There is little business doing in this market. We quote: Steel billets, tidewater, $23.50@$24.50; foreign, $28.50@$29; wire rods, $31.50@$32; foreign, $40@$40.50; Swedish, $52@$53.

Manufactured Iron and Steel.—Very little business is doing in manufactured iron and steel, Prices continue low and unchanged. We quote: Angles, 1·75@2c.; axles, scrap, 1·90@2·10c., delivered; steel, 1·85@2c.; bars, common, 1·50@1 60c.; refined, 1·65@1·9c. on dock; beams, up to 15 in., 1·80@2c.; 20 in., 2·10@2·30c.; car truck channels, 2@2·10c.; channels, 1·90@2·10c. on dock; hoops steel, 1·8@1·9c., delivered; links and pins, 1·85@2·10c.; plates, flange, 2@2·10c.; firebox, 2·5@2 8c.; flange, 2·10@2·25c.; marine, 2·50@2·75c.; sheared, 1·85@2·10c.; shell, 1·95@2·10c.; tank, 1·75@1·9J; universal mill, 1·80@1·90c.; tees, 1·95@15c., all on dock.

Merchant Steel.—The market continues dull. Quotations are: Tool steel, 6·50@6·75c. and upward; tire steel, 2@2·10c.; toe calk, 2·20@2·30c.; Bessemer machinery, 2·10@2·20c.; Bessemer bars, 1·80@2c.; open hearth machinery, 2·20c.; open hearth carriage spring, 2·10@2·20c.; crucible spring, 3·75@4c.

Old Material.—The few buyers in the field get al the scrap needed at their own prices. Quotations, in the absence of sales on which to base them, are nominally as follows: Old iron rails $15.50@$16; steel rails, $11.50@$13; car wheels, $11.50@$13.50.

Rail Fastenings.—The market for rail fastenings continues lifeless. Quotations remain: Fish and angle plates, 1·55@1·60c. at mill; spikes, 1·9@1·95c.; bolts and square nuts, 2·45@2·50c.; hexagonal nuts, 2·55@2·60c., delivered.

Spiegeleisen and Ferromanganese.—No business has been done in either spiegel or ferro during the past week. Quotations are nominally as follows: 10 to 12% Spiegel $22@$22.50, 20% $25@$25 50; Ferro, $56@$57.

Steel Rails.—Only one or two small sales of standard sections for the week. The market continues very dull. Quotations are unchanged at $29 mill or tidewater. Girder rails, $31@$33. Steel rails fit to relay can be had for $19@$20.

Tubes and Pipe.—Business in tubes and pipes continues quiet. Ruling discounts on carload lots are as follows: Butt, black, 57½, 10 and 5%; butt, galvanized, 50, 10 and 5%; lap, black, 67½, 10 and 5%; lap, galvanized, 57½, 10 and 5%.

NOTES OF THE WEEK.

It now seems quite probable that the Amalgamated Association scale will be signed by the greater part of the firms concerned. Up to Wednesday 26 firms had signed. The conference has been adjourned *sine die*. A revised scale has been prepared and the officers of the Association believe, as is stated above, that it will be signed.

The Bulletin of the American Iron and Steel Association, issued July 20th, gives the following statistics of the production of pig iron in the United States during the first six months of the year, and the stocks on hand July 1st:

The total production of pig iron in the United States in the first half of 1893 was 4,562,918 gross tons, against 4,387,317 tons in the second half of 1892, an increase of 175,601 tons. The production in the first half of 1892 was 4 769,683 tons. Compared with the first half of 1892, the production of the first half of 1893 shows a decrease of 206,765 tons. Pennsylvania largely increased her production in the first half of 1893, and there was a large decrease in Illinois.

The production of Bessemer pig iron in the first half of 1893 was the largest half-yearly production in our history, amounting to 2,374,890 gross tons, against 2,189,696 tons in the second half of 1892, and 2,254,345 tons in the first half.

The production of spiegeleisen and ferro-manganese in the first half of 1893, which is included in the statistics of total pig iron, was only 47 976 gross tons, against 91,757 tons in the second half of 1892 and 87 374 tons in the first half.

The number of furnaces in blast on June 30th, 1893, was 226, against 253 on December 31st, 1892, and 256 on June 30th, 1892. The number out of blast on June 30th, 1893, was 312.

The stocks of pig iron which were unsold in the hands of the makers or their agents for June 30th, 1893, and which were not intended to be used by the manufacturers, amounted to 549,141 gross tons, in which figures are included a part of the stocks held in the yards of the American Pig Iron Storage Warrant Company, and which was under the control of the makers, the part in these yards not under their control amounting to 29,690 gross tons, which, added to the 549,141 tons above mentioned, makes a total of 578,831 gross tons which were on the market at that date.

The stocks of pig iron which were unsold in the hands of manufacturers or their agents, or were under their control in warrant yards on December 31st, 1892, and which were not intended for their own consumption, aggregated 506,116 gross tons. On the same date there were in storage warrant yards and not under the control of the makers 29,500 tons of pig iron, making a total of 535,616 tons which were on the market at that date, against 578,831 tons similarly held on June 30th, 1893.

There was, therefore, a total increase in stocks of pig iron on the market at the close of June last, as compared with the end of December, 1892, of 43,215 tons. The accumulation of stocks was chiefly in coke and bituminous pig iron.

Buffalo. July 21.

(Special Report of Rogers, Brown & Co.)

Consumption is steadly dropping off. Each week records a lower mark in dullness of new business than the preceding. With the exception of "labor," which is still clamoring for higher wages, no one is trying to make money. All are busily engaged rowing for the shore. Prices remain about the same and while weak in a way yet few furnaces are forcing sales.

We quote for cash f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, $14; No. 2 X foundry strong coke iron, Lake Superior ore, $13.25; Ohio strong softener No. 1, $14; Ohio strong softener No. 2, $13.25; Jackson County silvery No. 1, $17@$17.30; Jackson County silvery No. 2, $16 30@$16.80; Lake Superior charcoal, $16; Tennessee charcoal, $16; Southern soft No. 1, $13.65; Alabama car wheel, $18; Hanging Rock charcoal, $20.50.

Chicago. July 20.

(From our Special Correspondent.)

The indisposition of manufacturers of crude iron generally to bank their blast furnaces for some six or eight weeks, as was desired by a number of them last week, has resulted in some accumulation of stock, but not enough to cause any serious disturbance. In point of fact, there is a big reduction in output, but the heavy decrease in consumption and failure of many consumers to take their regular quota, have caused an apparent increase in stocks at furnace.

The market is more hopeful, but the trade, as a whole, is suffering from slow collections and a disposition on the part of seller and buyer to exercise great caution. With the exception of usual season's contracts there is very little doing in finished iron and steel. Railroads are doing a heavy business, and this fact conduces to give a more cheerful outlook to the steel rail trade.

Pig Iron.—Several transactions involving round quantities for delivery distributed through the year for local coke iron are reported. Outside of these deals the business for the past week has been very light, though a better inquiry has developed, more particularly from consumers outside of Chicago. Lake Superior charcoal iron continues dull and a large tonnage in second hands presses for sale. Southern coke iron is very quiet and the actual business done is no greater than it was at the end of June. Very low prices are named to cash purchasers and many bargains are thus secured. Efforts on the part of some furnaces to hold up prices meet with poor success.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $16.00@$16.50; Lake Superior coke, No. 1, $13.50@$13.75; No. 2, $12.75@$13.25; No. 3, $12.25@$12.50; Lake Superior Bessemer, $14.00; Lake Superior Scotch, $14.50@$15; American Scotch, $15.50@$16.50; Southern coke, foundry, No. 1, $14.00; No. 2, $12.35; No. 3, $12.00; Southern coke soft, No. 1, $12 75; No. 2, $12.50; Ohio silveries, No. 1, $16.50; No. 2, $16.00; Ohio strong softeners. No. 1, $16.25; No. 2, $16.00; Tennessee charcoal, No. 1, $17; No. 2, $16.50; Southern standard car wheel, $18.50@$19.

Structural Iron and Steel.—The tonnage now being placed for bridge or building material is very light, and the outlook for the near future is unsatisfactory. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, $1.75@$1.85; tees, $1.95@$2.05; universal plates, $1.75@$1 85; sheared plates, 75c.@$1.85; beams and channels, $1.80@$1.90.

Plates.—There is even less business doing than there was a week ago. Several inquiries have reached this market for heavy sheet steel for irrigating purposes in the far Northwest. Steel sheets, 10 to 14, $2 25@$2.35; iron sheets, 10 to 14, $2.20@$2.30; tank steel, $1.90@$2; shell iron or steel, $2.50@$2.75; firebox steel, $4.25@$5 25; flange steel, $2.74@$3; boiler rivets, $4@$4.15; boiler tubes, all sizes, 65%.

Merchant Steel.—The buying movement from the implement trade generally and from the plow makers in particular is more active, and some of the heaviest consumers are in the market for material. Agents are kept busy with specifications. Quotations are: Tool steel, $6.50@$6.75 and upward; tire steel, $2@$2.10; toe calk, $2.30@$2.40. Bessemer machinery, $2.10@$2.20; Bessemer bars, $1.60@$1.70; open hearth machinery, $2.25@$2.30; open hearth carriage spring, $2.10@$2.20; crucible spring, $3.75@$4.

Galvanized Sheet Iron.—Orders are very light from all consumptive sources, and discounts continue easy at 70, 10 and 5% off on Juniata and 70, 10 and 10% off on charcoal, and jobbing quantities at 70 and 7½% off on the former and 70 and 10% off on the latter.

Block Sheet Iron.—In the way of mill orders little is being done, but good iron cannot be bought in this market for less than 2·85c. for No. 27 common, and 2·90@2·95c. for steel. Jobbers quote 3c. for iron and 3·10@3·15c., for steel, same gauge.

Bar Iron.—Buying in small lots for prompt shipment is rather more active on account of the shutdown of mills. Season's contracts are in good inquiry, but consumers slow to close. The more conservative mills are not disposed to sell on long time and are now quoting 1·45c.@1·50c., 60 days, 2% for cash, to any class of consumers. Jobbing trade is more active at 1·65@1·75c. base on iron and steel bars.

Nails.—Wire nails are still in poor demand, but agents are not urging sales at present and refuse current price, $1 45. Chicago, for fall shipments. Jobbers quote $1.55 from stock in less than carloads. Steel cut nails are very dull from mill, and price easy at $1.23, base. Jobbing trade is light at $1.35 from stock.

Steel Rails.—So far no sales of any moment have been made for fall delivery, but inquiry is assuming a better form and the steel mills here are inclined to believe that a very fair tonnage will be handled during the next two months. Quotations remain steady at $30@$31.

Scrap.—Dealers and brokers report a perfectly flat market—neither inquiry nor demand for anything, and prices quoted merely nominal. Railroad, $13 50; No. 1 forge, $12; No. 1 mill, $9.00; fish plates, $14.50; cast borings, $5.00; wrought turnings, $7.50; axle turnings, $9.25; machinery castings, $10; stove plates, $7.50; mixed steel, $9; coil steel, $15; leaf steel, $15; tires, $14.50.

Old Material.—Offerings of iron rails are large, but we hear of no sales, and a nominal quotation would be $16.50, but it is doubtful if consumers would pay those figures. Old steel rails show no movement at $10@$13, according to length, etc. Car wheels are stagnant at $14@$14.25.

Philadelphia. July 20.

(From our Special Correspondent.)

Pig Iron.—Several furnace representatives have been in town talking over trade prospects. They do not believe the restricted production will have any immediate effect on prices. Very little business is done and buyers are careful to use brands that can be had at concessions. Best No. 1 is held at $15.50, but good iron can be had at $15, and good Southern No. 1 is offered to-day at $14.50 on buyer's time. It is probable some No 2 good brand (Southern) will go at $13 75. Forge iron transactions are not heard of and stock is offered without takers at $13@$13.50. Sales of Bessemer have been made at $16; low phosphorus, at $18.

Muck Bars.—At last some business is promised at $23.25.

Bars.—Very little business is done at any price. Common is 1·55. No recovery is in sight. Mill owners are discouraged and will not be in a hurry to resume.

Nails.—The nail trade is dull.

Sheet Iron.—Quite a run of business is reported this week at stores. Mills have resumed and a full production will probably be risked, although orders do not warrant it.

Skelp.—No sales are reported this week.

Pipe.—Small orders have been booked this week for August delivery.

Plate and Tank manufacturers say there is enough business in sight for the fall, but until then there will not be orders to take all that mills can produce at double turn. Much work, it is explained, is held back for the time being.

Structural Material.—Three or four orders aggregating about five thousand tons were to have been placed this week, but there is a hitch. The Bourse order is likely to be placed any day. Small orders are not often heard of, but manufacturers all say fall and winter prospects are excellent. Prices are weakening on small orders For big work it is probable the lowest possible quotations have been made. Angles were quoted at $1.75, while beams, ties and channels are $1.90.

Steel Rails.—Some business is done at $32@$35 for light rails, and from all that can be learned a good fall business is probable. For standard sections $29 is the quotation, but scarcely any business is reported by the local offices.

Old Rails.—Those who have old rails to sell are anxious to find buyers at $16. Street rails have sold at $18. No. 1 railroad scrap is plenty at $14.

Pittsburg. July 20.

(From our Special Correspondent.)

Raw Iron and Steel.—The market continues in the same weakened condition as noted for some time past. When we wrote our last review prospects seemed favorable for an early adjustment of the scale question; since then matters have changed, the settlement has been postponed, for how long is something that will be settled later on. In this district but two firms have agreed, namely, James & Laughlin and Painter & Sons. They were granted special privileges that are refused to other manufacturers, and that is where the trouble comes in; they demand equal rights, which at present do not seem likely to be granted.

The fact is there is general dissatisfaction in Western Pennsylvania and Ohio, the extent of which will be learned later. Unless a settlement is arrived at, certain manufacturers say that when repairs and stocktaking are completed their mills will start. A part of Singer, Nimich & Co.'s steel mill in the West End have resumed operations under the 10% reduction previously offered. As for the Mahoning and Shenango Valley manufacturers, no understanding has been reached with them, and it is probable that the Amalgamated Association will meet with just as much opposition from the valley firms as they did at the conference with the Pittsburg firms.

The important move made by the individual producers of pig iron to keep the supply of crude iron well within the limits of the demand, by the blowing out or banking of furnaces, has had a beneficial effect generally on this branch of the trade. Many of the manufacturers were, however, compelled to follow this course in consequence of the close competition and the inability to secure accommodation from the banks.

It is a matter of general remark that payments have been better than might have been expected, but their are few orders coming in. This probably marks the culminating point of the condition of affairs which prevailed for some time past.

Bessemer Iron Ore.

Tons.		Cash.
3,500	Bessemer at Lake Erie Dock	$3.60

Coke Smelted Lake and Native Ore.

1,000	Bessemer, July, August	13.25
1,000	Bessemer City furnace	13.50
1,000	Bessemer City furnace	13.50
500	Bessemer, July.	13.25
500	Bessemer, July, August	13.25
500	Bessemer, July, August	13 10
500	Gray Forge	12.25
300	Gray Forge	12.25
3	Gray Forge	12 00
200	Gray Forge	12 06
150	No. 1 Foundry	14 00
150	No. 2 Foundry	13.00
100	No. 1 Silvery	15.50
75	No. 2 Silvery	14.50
50	No. 1 Foundry	13.75
50	No. 2 Foundry	12.75

Charcoal.

100	Cold Blast	24.00
100	Cold Blast, extra	29.00
100	Warm Blast, off grade	16.00
50	No. 1 Foundry	19 80
25	No. 2 Foundry	18.50

Steel Billets and Slabs.

Tons.		Cash.
1,000	B. & S., Aug., Sept. Oct. at mill	$21.15
1,000	B. & S., July, Aug. at mill	21.40
500	B., Aug., at mill	21.25

Muck Bar.

500	Neutral, July	22.00
200	Neutral, July	21.80
150	Neutral	22.00

Skelp Iron.

150	Sheared	1.12½ 4m.
150	Wide grooved	1.12½ 4m.
100	Narrow gr'v'd	1.12½ 4m.

Skelp Steel.

180	Wide Gr'v'd	1.40 4m

Sheet Bars.

500	S. B., at mill	27.6
150	S. B., at mill	27.50

Blooms, Billets and Bar Ends

650	Blooms and Billet Ends	14.50

Ferro-Manganese.

150	80% Domestic	$58.00

Scrap Material

650	Melting stock gross	15.50
100	No. 1 R. R., wrought I., net	14.00
150	No. 1 R. R., in yard	13.50
100	wrought firings	10.25

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 21.

Statement of shipments of anthracite coal (approximated) for week ending July 15th, 1893, compared with the corresponding period last year:

	July 15, 1893. Tons.	July 16. 1892. Tons.	Difference.	
Wyoming region	488.170	483,896	Inc.	4 274
Lehigh region	138,213	113,309	Inc.	24,90
Schuylkill region	197,781	240,266	Dec.	42,48
Totals	824,165	8?7,471	Dec.	13,306
Total for year to date	22,613,816	21,254,530	Inc.	1,359,286

PRODUCTION OF BITUMINOUS COAL for week ending July 15th and year from January 1st:

Shipped East and North:	1893. Week.	1893. Year.	1892. Year.
Phila. & Erie R. R.	478	48,162	47,215
Cumberland, Md.	86 010	2,160,286	1,95?,845
Barclay, Pa	5 3	32,308	108,499
Broad Top, Pa.	9,259	367,490	3?7,384
Clearfield, Pa.	74,536	2,265,402	2,156 164
Allegheny, Pa.	18,9?8	698,471	654,326
Beach Creek, Pa.	25,783	87?,146	1,357,197
Pocahontas Flat Top	45,554	1,562,224	1,248,354
Kanawha, W. Va.	37,130	1,687,371	1,281,275
Total	298,303	9,692,230	9,125,259

Shipped West:	1893. Week.	1893. Year.	1892. Year.
Pittsburg, Pa.	22 739	701,623	700,523
Westmoreland, Pa.	31,531	1,096,550	885,506
Monongahela, Pa.	8,766	412,063	316,884
Totals	66,036	2,210,216	1,902,863
Grand totals	364,339	11,028,122	11,028,122

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending July 15th, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 79,3?0 tons; year 2,874,?73 tons; to corresponding date in 1892, 2,985,900 tons.

Anthracite.

The market continues even duller than might be expected at this season. Prices under the July circular seem to be fairly well maintained, although some shipments are still being made on the June circular, and there is always some "cutting" under various plausible disguises. We have one direct statement of a sale of 1,000 tons at 15c. below the full rate, with 5c. additional to equalize freight and towage. The agreement for restricting tonnage seems to be fairly well maintained, and the month's shipments will be little above the agreed amount. How long this will continue to be the case is, however, doubtful, as there are several disturbing elements in sight, prominent among them being the evident determination of the Pennsylvania Railroad Co. to extend its tidewater trade, and its past history, which shows it to have kept out of restricting combinations to its manifest advantage.

The coal tonnage of the Reading system (estimated) for the week ending July 15th was 350,000 tons, of which 30,000 tons were sent to Port Richmond, and 40,000 tons to the New York shipping points.

The official statement of anthracite shipments and stocks for June and for the year to July 1st:

	June, 1893.	June, 1892.	1893.	Year 1892.
Wyoming	2,340,174	2,170,789	11.868,681	10,659,667
Lehigh	644 555	562,914	3,317,792	2,832,785
Schuylkill	1,130,902	1,088,103	5,836,379	5,887,274
Totals	4,115,632	3,821,807	21,022,853	19,379.727

The stock of coal on hand at tidewater shipping points June, 1893, was 808,854 tons; on May 31st, 1893, 878,024 tons; decrease, 68,160 tons.

The Reading official circular rates are as follows, f. o. b. at its New York harbor shipping ports:

	Broken.	Egg.	Stove.	Chestnut
Hard white ash	$4 00	$4.25	$4.60	$4.60
Free white ash	3.90	4.15	4.60	4.60
Shamokin	...	4.50	4.80	4.60
Schuylkill R. A.	....	4.50	4.95	4.75
Lykens Valley	5.00	5 80	6.20	4.45

Pea, $2.50@$2.75; No. 1 buckwheat, $1.75@$2.00; No. 2 buckwheat, $1.50.

Pea and buckwheat are in good demand.

Rates at Port Richmond for shipment are 25c. per ton below these figures.

NOTES OF THE WEEK.

The Philadelphia & Reading Coal and Iron Company in order to carry into effect the restriction of output agreed upon, now works but four days per week, closing down on Fridays and Saturdays. The Lykens Valley and Pine Grove collieries are not subject to the above rule, and are working full time, as is also one of the Lorberry collieries.

Bituminous.

The bituminous coal trade is more than usually dull, owing to the shutting down of a large number of Eastern mills. As a consequence of this, most of the coal companies have reduced their output. However, the best coals have had the pick of the trade, and hence shipments of higher grade coals are keeping up better than those of the lower grades. It is said that the shipments of Pocahontas from Norfolk this year will reach 2,000,000 tons. During the week there have been various rumors to the effect that some of the Eastern roads have placed contracts, but there are many elements of doubt in connection with these particular rumors, and they are given but little credence in the trade.

The supply of cars at all points is good, but this is in part caused by a lessened demand. Shipments are made in quick time. Owing to the shortage of orders there is but little demand for ocean freights and they are consequently falling. We quote the following rates: Philadelphia to Boston, Salem, Portland and Portsmouth, 70c. alongside; 65c. to Sound ports and 75c. to ice ports (in Maine), with regular tonnage added where customary. Baltimore, Norfolk and Newport News, 5c. higher than Philadelphia rates. We hear that ice freights back are low, and consequently vessel property is for the time being unprofitable. Orders for New York shipping points are more scarce than for the lower ports. In fact, to sum it all up, the market is dull and no improvement is anticipated until September.

Buffalo. July 20.

(From our Special Correspondent.)

The anthracite coal business is confined to few local orders apparently. Prices unchanged. Supply on docks and in trestles is large in the absence of heavy shipments by lake. It will be seen from annexed figures that the week's exports by lake are less than 50,000 net tons, a great falling off. Many vessels are tied up for a time, as no money can be made at present-going rates for grain west to east, and the absence of cargoes of coal for return freight.

The advance in coal quotations has not been favorably received by consumers, and many are holding off expecting a decline in the near future.

Bituminous coal moderately active for vessel use and fairly active for manufacturing purposes. Prices firm at unchanged figures. Supply adequate to all requirements, with no overplus worth noting.

According to the new directory of Buffalo, published yesterday, we have a population of about 325,000!

A local newspaper writing of the lake situation says: The dull season used to settle down upon the lakes before June was over, but of late years it has not come at all, so the appearance of it now, especially with the general slackness of business, makes marine men not only downhearted, but creates the feeling that it may last for some time. Vessels are piecing out business as well as they can, and those that have season ore charters are reckoned very lucky.

Messrs. Thomas Loomis & Co. have received the contract for supplying coal to the municipal building and to the schools; prices given last week.

The coal traffic through the Sault Ste. Marie canal aggregated this year to July 1st 883,190 net tons as compared with 1,015,788 tons in 1892, 806,290 tons in 1891, 684,729 tons in 1890, and 419,413 tons in 1889.

The Pennsylvania & Ohio Company's coal dock at Duluth is about completed. The capacity will be in the neighborhood of 100,000 tons. An extension of 300 ft. is to be made next year if business warrants the outlay.

The shipments of coal by lake westward from Buffalo for the week ending July 15th were only 49,820 net tons, distributed as follows: 18,800 to Chicago, 4,380 to Milwaukee, 6,480 to Duluth, 2,000 to Superior, 1,660 to Kenosha, 1,080 to Green Bay, 2,100 to Gladstone, 1,075 to Port Huron, 600 to Toledo, 1,650 to Lake Linden, 1,610 to Bay City, 1,660 to Saginaw, 1,100 to Sheboygan, 1,450 to Detroit, 2,425 to Racine, and 1,750 to Hancock. The rates of freight were 50c. to Chicago, Manitowoc, Sheboygan and Kenosha; 70c. to Sarnia; 45c. to Milwaukee; 60c. to Racine; 30c. to Duluth, Superior, Port Huron, Toledo, Detroit and Gladstone, and 40c. to Escanaba, Saginaw, Lake Linden, Green Bay and Hancock.

Yesterday and to-day there was a more buoyant feeling among vessel men, but shipments of coal continue light, as shippers do not seem to care about increasing the stocks out west at present.

Chicago July 20.

(From our Special Correspondent.)

In spite of the stringent orders alluded to in our last letter as having been issued to the Chicago agents of the shippers of anthracite coal, this market continues on the verge of demoralization. Coal has been and is offered freely at June circular. All the shippers are doing more or less retail business, and the regular retailers report exceedingly dull trade; only one or two of the larger retailers claim to be doing a satisfactory business.

The bulk of last year's trade was in July and August, which this year will be done in September and November. The country dealers were not out of coal. The principal trouble appears to be the lack of ready money and the inability of the average country dealer to obtain money enough to pay his freights. Especially is this so this season, as it is quite a trick of the shippers to let their all-rail coal run through to destination with all the advance charges from mines following. Hence by the time the dealer gets his coal and pays freight thereon he has practically paid cash in advance for his stock. Some shippers, who are compelled by their Eastern producers to adhere strictly to circular, are complaining bitterly of the dullness of trade, and are giving their salesmen vacations.

Bituminous coal of all grades is very quiet, and the recent orders from the freight departments of the various railroads here insisting on the payment of freight before the removal of coal is bearing hard upon some of the shippers. Large and small dealers are affected alike, as some of the coal carrying roads have suffered serious losses of late by allowing freight bills to accumulate. As a consequence of the foregoing the tonnage marketed here shows a large falling off during the past few weeks, particularly in the line of steam varieties. As a further sequence the output of many mines in Ohio, Indiana and Illinois is being restricted, though the curtailment of production is largely due to the monetary stringency. In Ohio this is affecting shipments by boat, and it is feared it will be impossible to forward sufficient stock to the head of the lakes before the close of navigation. Indiana and Illinois mines are running about half time, and circular on best grades is fairly steady.

Coke continues dull and there is now quite a little quiet cutting being done in the Connellsville article as a result of the recent big contract placed for Pocahontas (W. Va.) coke. Some radical reductions in price or freight will have to be made by the Connellsville operators if they wish to maintain their hold on their market.

Quotations are: $4.05 furnace; $5.05 foundry, crushed; $5.40 Connellsville; West Virginia: $3.90 furnace, $4.10 foundry; New River Foundry, $4.65; Walston: $4.65 furnace, $5 foundry.

Circular prices are at the following rates: Lehigh lump, $6.25; large egg, $5.85; small egg, range and chestnut, $6 10. Retail prices per ton are: Large egg, $6.75; small egg, range and chestnut, $6.75.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, $3.35; Hocking Valley $3.10; Youghiogheny, $3 25; Illinois block, $2.50; Brazil block, $2.50.

Pittsburg. July 20.

(From our Special Correspondent.)

Coal.—There is nothing very important so far as this article is concerned; the mines are closed for the want of empties to load. The dispute in regard to the iron scale has closed the iron mills, a combination that makes trade dull. The coal shippers are becoming disheartened, as there may be no rise before fall; in that case there is trouble ahead. A dispatch from Cincinnati says: All Pittsburg coal has been advanced to $3 per ton owing to the short supply; two of our large shippers have over 6,000,000 bushels loaded. Coal loaded and ready in the pools and Pittsburg harbor now exceeds 16,000,000 bushels, all which is wanted in the lower markets. There has been an increase in coal shipments to the Lakes, principally in old contracts or new ones; an advance of 5c.@10c. per ton is asked.

Connellsville Coke.—The situation in the region is extremely bad; coke works are being shut down in all directions. The Cambria Iron Works closed down 604 ovens; 80 ovens of the Atlas will be run two days a week; 700 workmen are out of employment. Serious reductions in the wages of the cokers have been made, and the price of coke has been cut to $1.25@$1.35 per ton at the ovens. The wages paid in the region have been based on $1 90 coke, and the minimum rate of wages under the scale cannot go below $1.75 coke. The H. C. Frick and McClure coke companies are credited with paying full wages so far. Week's shipments 4,880 cars or 88,920 tons, distributed as follows: To Pittsburg, 1,800 cars; to points east, 1,150 cars; to points west, 1,930 cars. Western shipments decreased 296 cars, Eastern shipments 300 cars, and Pittsburgh shipments 135 cars; total 731 cars, and fully 2,000 cars in the last four weeks.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 21.

Heavy Chemicals.—The market continues dull, as is to be expected at this time of the year. The efforts of buyers to break prices have so far been without results. Heavy chemicals are for the most part held by agents, and these cannot lower prices in order to make sales, being governed by their principals. Prices are nominally quoted as follows: Caustic soda, 60%, 2·95@3·10c; 70%, 2·70@2·90c.; 74%, 2·72½@2·82½c; 76%, 2·90@3·00c. Carbonated soda ash, 48%, 1·25@1·30c.; 58%, 1·15@1 25c.; Alkali, 48%, $1.15@$1.20.; 58%, $1.10@$1.20, according to package. Sal soda, English, on the spot, 0·95c. American 95@1c.; bleaching powder, 2·25@2 37½c.; English United Alkali Association price, 2.50.

Acids.—There is no change in prices to report; prices continue firm and the demand is better than could be expected. We quote as follows: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, $1.87½; in carboys, $2 25; muriatic, 18°, 90c.@$1.10; 20°, $1@$1.25; 22°, $1.10@$1.35; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 90c.@$1.25; mixed acids, according to mixture, oxalic, $6.30@$6.50. Blue vitriol is quoted all the way from $3.50 to $3.75; glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—The raid made by buyers to break prices in the chemical trade has been more successful in brimstone than in any other article. Within the week the price has suffered a decline of 50c per ton, and it would seem as though the bottom has not yet been reached. Sellers say, however, that the decline now under way has been going on for more than a year. Our prices of July 23d, 1892, were $24.50@$25 for seconds, and $23 60@$24 for thirds. On January 7th, 1893, we quoted $22 for seconds and $21.25 for thirds. Our present quotations are $18.50@$19 for best unmixed seconds, and $17 75@$18.25 for thirds. Business is dull, and but few sales are being made.

Fertilizing Chemicals.—Owing to the stringency in the money market, buyers are holding off and the ammonia salts are weaker in consequence. There have been some changes in prices, which we note below as follows: Dried blood, $2.20@$2.25 per unit for high grade, and $2.15 for low grade; azotine, $2.25@$2.30; sulphate of ammonia, $3 15 for gas liquor; bone liquor is offering at $3@$3.10. Concentrated phosphate (30% available phosphoric acid), 75c per unit. Acid phosphate, 13% to 15%, av. P_2O_5 @60c. per unit at sellers' works in bulk. Dissolved boneblack, 17% to 18%, P_2O_5@85c. per unit in bulk. Double superphosphate, 40% and above, soluble and 5% av., say, total of 48%, av. P_2O_5 @85c. per unit in bags. Acidulated fish scrap, no stocks on hand; dried scrap is quoted at $25 f. o. b. fish factory. Tankage, high grade, $25 50@$26; low grade, $24@$25 Bone tankage, $24@$25; bone meal, $24@$25.50

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, $1.12; Philadelphia, $1.14½; Charleston and Savannah, $1.17 cwt., basis 48@50%, in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%–96%, basis 90%: New York and Boston, $2.07; Philadelphia, $2.09½; Charleston and Savannah, $2 127, sulphate of potash, 96–99%, basis 90%, is 4% higher.

Phosphates.—Quotations for high grade land rock, f. o b. Charleston are $4.50@$4.75. Freights are $2 25.

Muriate of Potash.—The market is quiet. The prices fixed by the syndicate for 1893 are as follows: New York or Boston, $1.78; Philadelphia, $1.80½; Southern ports, $1.83.

Kainit.—Practically nothing is doing in kainit. Quotations for shipments previous to September are as follows: New York, Philadelphia and Boston, $8.75 for foreign, invoice weight and test, and $9 for actual weight; Charleston, Savannah and Wilmington, $9 50 for invoice weight and test, and $9.75 for actual weight. Shipments after September 1st, 25c. higher.

Nitrate of Soda.—The nitrate market is dull, and prices have slightly fallen, without, however, any increase of business. Quotations are: $1.7.@$1.75 for goods on the spot and $1.80 for future, with no business to report in the latter.

Liverpool. July 11.

(Special Correspondence of Jos. P. Brunner & Co.)

If anything, there is a little better feeling in heavy chemicals, but the actual business passing is a long way behind the average. The prospect of a coal strike has, perhaps, influenced buyers to some extent, but only very slightly, as it is generally hoped that anything like an extensive strike will be averted.

Soda ash is rather more inquired for, but quotations are unreliable and depend upon market, quantity, quality, etc. For Leblanc makes, nominal spot quotations are about as follows: Caustic Ash 48%, £4 10s.@£5 per ton; 57 to 58%, £5 10s.@£5 15s. per ton, net cash. Carb. Ash 48%, £4 15s.@£5 per ton; 58%, £5 5s.@£5 15s. per ton net cash. Ammonia Ash 58% is quoted at £4 7s. 6d.@£4 10s. per ton, less 2½% and the higher figure said to have been paid for 350 tons July and August, of a special make.

Soda crystals are held for £2 17s. 6d@£3 per ton, less 5%; and a moderate trade doing.

Caustic soda in rather better demand, but with large stocks at works prices are tending downward. Quotations vary considerably according to export market. Newest spot range is as follows: 60%, £8@£9 per ton; 70%, £9@£10 per ton; 74%, £10@£11 per ton; 76%, £11 10s @£12 per ton net cash. For parcels under 10 tons, 5s. per ton extra is charged.

Bleaching powder is not active, but prices keep firm at £8 10s.@£8 15s. per ton net cash for hardwood packages.

Chlorate of potash has been quite demoralized, and with resellers pressing sales 7¾d. has been accepted for prompt and July delivery. There is a better tone this week, however, as most of the weak sellers are about cleared out, and although there is still a little to be had for this month at 7¾d. holders generally quote 8d. For August delivery, we quote 7⅞d.@7¾d., and July-December, 7½d.@7¾d.

Bicarb. of soda in fair request at £6 15s. per ton, less 2½% for 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia continues very small compass, and £13 15s. per ton, less 2½%, is nearest spot value for good gray 24-25%, in double bags f. o b. here, and difficult to find sellers.

Nitrate of Soda.—As stock is almost exhausted on spot, fancy prices are still asked, and £10 5s.@£10 10s. are nearest spot quotations for double bags f. o. b. here, less 2½%. A considerable reduction would be accepted for near arrivals.

Carbonate of Ammonia.—Lump 3¼d. per lb. Powdered, 3½d. per lb., less 2½%.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, chem. pure .17@.19
Commercial, in bbls. and cbys. .01¾@.2
Carbonic, liquefied, ℔ lb. .18@.25
Chromic, chem pure, ℔ lb 1 00
for batteries .40
Hydrobromic, dilute, U. S. P. .2[illegible]@.30
Hydrocyanic, U. S. P. 4 @.50
Hydrofluoric 2 @.30
Alcohol—95%, ℔ gall. $2.30@$2.4[illegible]
Absolute $3.80
Ammoniated $2.8[illegible]
Alum—Lump ℔ cwt. $1.75@$1.85
Ground, ℔ cwt. $1 80@$1.90
Powdered, ℔ lb. .04½@.05
Lump ℔ ton, Liverpool £5
Aluminum Chloride—Pure, ℔ lb. $1.25
Amalgamating solution, ℔ lb. .60
Sulphate, ℔ cwt $1.90@$2.50
Ammonia—Cal., in bbl. lots ℔ lb. .07½@.08
Carbonate, ℔ lb., English and German, .07½@.08
Muriate, white, in bbls., ℔ lb. .08½
Aqua Ammonia—(in cbys) 3° ℔ lb. .03@.04
20°, ℔ lb. .04@.05
26°, ℔ lb. 04¾@.05
Antimony—Oxymur, ℔ lb. .04@.06
Regulus, ℔ lb. .10@.11½
Argols—Red, powdered, ℔ lb. .1[illegible]
Arsenic—White, powdered ℔ lb. .03@.03¾
Red ℔ lb. .06½@.07
Yellow .08@.09
White at Plymouth, ℔ ton £12 2 6
Asbestos—Canadian, ℔ ton £50@£300
Italian, ℔ ton, c. i. f. L'pool £18@£60
Ashes—Pot, 1st sorts, ℔ lb. 4 75@5
Pearl .05¾@.06¼
Asphaltum—
Prime Cuban, ℔ lb. .04@.05
Hard Cuban, ℔ ton $28.00@$30.00
Trinidad, refined, ℔ ton $30.00@$35.00
Egyptian and Syrian, ℔ lb. .05@.07
Californian, at mine, ℔ ton $12.00@$26.00
at San Francisco, ℔ ton, $15.00@$29.00
Barium—Carbonate, pure, ℔ lb. .45
Carbonate, commercial, ℔ lb. .03@.10
Chlorate, crystal, ℔ lb. .75
Chloride, commercial, ℔ lb. .05@.10
pure, ℔ lb. .16
Iodide, ℔ oz. .40
Nitrate, ℔ lb. .06¼@.07
Sulph., Am. prime white, ℔ ton $17.50@$19
Sulph., foreign, floated, ℔ ton $21@$24
Sulph., off color ℔ ton $11.50@$15 00
Carb., lump, f. o. b. L'pool, ℔ ton £6
No. 1, Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " £3 15 0
Bauxite—℔ ton $10.00
Bichromate of Potash—Scotch, ℔ lb .11@.12
American, ℔ lb. .11@.12
Bichromate of Soda—℔ lb. .09½@.10
Borax—Refined, ℔ lb., in car lots .08@.09
San Francisco .08@.08½
Concentrated, in car lots .07½@.08
Refined, Liverpool ℔ ton £3

Bromine—℔ lb. .25@.35
Cadmium Minion—℔ lb. $2.00
Cadmium Iodide—℔ lb. $5.50
Chalk—℔ ton $1.50@$2.2[illegible]
Precipitated, ℔ lb. .04@.06
China Clay—English, ℔ ton $13@$18.00
Domestic, ℔ ton [illegible]9@$11
Chlorine Water—℔ lb. .10
Chrome Yellow—℔ lb. .10@.25
Chrome Iron Ore—℔ ton, San Francisco $10.00
Chromalum—Pure, ℔ lb. .35@.40
Commercial, ℔ lb. .02½
Cobalt—Oxide, ℔ lb $1.60@$1 70
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary, ℔ lb. .03¾@.03¾
" extra .0[illegible]
Nitrate, ℔ lb. .40
Copperas—Common, ℔ 100 lbs. .85@.95
Best, ℔ 100 lbs. $1.35@$1.50
Liverpool, ℔ ton, in casks £2 2@£2 10s.
Corundum—Powdered, ℔ lb. .04½@.09
Flour, ℔ lb. .03
Cryolite—Pow., ℔ lb., bbl. lots .07@.08
Emery—Grain, ℔ lb. (℔ kg.) .04½@.06
Flour ℔ lb. .02½@.04
Epsom Salt—℔ lb. .01@.01½
Feldspar—Ground, ℔ ton $6.00@$10.00
Crude $2.00@$3 00
Fluorspar—Powdrd, No. 1, ℔ ton, $20@$30
Lump, at mine $6@$8
French Chalk—
Fuller's Earth—Lump, ℔ ton, $16@$20
Glauber's Salt—in bbls., ℔ lb. .01@.01¼
Glass—Ground, ℔ lb .09@.10
Gold—Chloride, pure, crystals, ℔ oz. $12.00
pure, 15 gr., c. v., ℔ doz. $5.40
liquid, 15 gr., g. a. v., ℔ doz. $5.50
Chloride and sodium, ℔ oz. $6.00
15 gr., c. v., ℔ doz. $2.75
Oxide, ℔ oz. $27.25
Gypsum—Calcined, ℔ bbl. $1.25@$1.50
Land Plaster
Iodine—Resublimed, ℔ oz. .30@ 33
Iridium—Oxide ℔ lb. $90
Iron—Nitrate, 40°, ℔ lb .01@ 01½
47°, ℔ lb. .02@.02¼
Kaolin—*See China Clay.*
Kieserite—℔ ton $9@$10
Lead—Red, American, ℔ lb .06¾@.07¼
White, American, in oil, ℔ lb. .06½@.07¼
White, English, ℔ lb., in oil .08¼@.08¾
Acetate, or sugar of, white .06@.06¾
Granulated
Nitrate .09@.12
Lime Acetate—Am. Brown .90@.95
" Gray $1.75@$1.87½
Litharge—Powdered, ℔ lb. .05½@.07½
English flake, ℔ lb. .06@.09½
Magnesite—Crude, ℔ ton of 1,016 kilos $14 75
Calcined, ℔ ton of 2,240 lbs. $22.00
Brick, ℔ ton of 2,240 lbs. $17.50
Manganese—Ore, per unit. .23@.28
Oxide, ground, ℔ lb .02½@.06½
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. .62@.64
Powdered, ℔ lb. .5

Marble Dust—℔ bbl. $1.2[illegible]@$1.50
Metallic Paint—Brown ℔ ton. $2[illegible]@$2[illegible]
Red $20@$22
Mineral Wool—Ordinary slag .01½
Ordinary rock .02½
Ground, ℔ ton
Mica—In sheets according to size.
1st quality, ℔ lb. .25@$6.00
Naphtha—Black
Nitre Cake—℔ ton $10.00
Ochre—Rochelle, ℔ lb. .01¼@01¾
Washed Nat Oxf'rd, Lump, ℔ lb. 0[illegible]@.06
Washed Nat Oxf'rd, Powder, ℔ lb. .07@.07½
Golden, ℔ lb. .03@.0[illegible]
Domestic, ℔ ton $12@$20
Oils, Mineral—
Cylinder, light filtered, ℔ gal. .14@.16
Dark filtered, ℔ gal. .10@.13
Extra cold test, ℔ gal. .21@.24
Dark steam refined, ℔ gal. .07½@.19
Phosphorus—℔ lb. .5[illegible] @ 5[illegible]
Precip., red, ℔ lb. [illegible]0@.85
white, ℔ lb. 85@.9[illegible]
Platinic Chloride—Dry, ℔ oz. $7
Plumbago—Ceylon, ℔ lb. .04@.0[illegible]
American, ℔ lb. .05@ 0[illegible]
Potassium—Cyanide, ℔ lb., C. P. 67% ℔ lb. .52 0
mining .28@ 3[illegible]
Bromide, domestic, ℔ lb. .[illegible]@ 32
Chlorate, English, ℔ lb. .18@.18½
Chlorate, powdered, English, ℔ lb. .18½@. 9
Carbonate, ℔ lb., by casks, 82% .04½@.05
Caustic, ℔ lb., pure slick .05½@.06
Iodide, ℔ lb. $2.58@$2.80
Nitrate, refined, ℔ lb. .06@ 0[illegible]
Bichromate, ℔ lb. 10@ 11[illegible]
Yellow Prussiate, ℔ lb. .21½@ 22½
Red Prussiate, ℔ lb. [illegible]9@.[illegible]
Pumice Stone—Select lumps, ℔ lb. .03½@.15
Original cks., ℔ lb. .01¼@.02
Powdered, pure, ℔ lb. .01½@.01¾
Pyrites—Non-cupreous, p. units. .12@.1[illegible]
Quartz—Ground, ℔ ton $6 00@$10.00
Rotten Stone, Powdered, ℔ lb. .03½@.03½
Lump, ℔ lb. .06@.07
Original cks, ℔ lb. .04½@.05½
Rubbing stone, ℔ lb. .03½@.04
Sal Ammoniac—lump, in bbls., ℔ lb. .80½
Salt—Liverpool, ground, ℔ sack .7[illegible]
Domestic, fine, ℔ ton $7@$7.[illegible]
Common, fine, ℔ ton $4.50@$[illegible]
Turk's Island, ℔ bush .26@ 2[illegible]
Salt Cake—℔ ton $10 00@$15.00
Saltpeter—Crude, ℔ lb. .03¼@.04
Soapstone—Ground, ℔ ton $[illegible]@$
Block and slab according to size
Sodium—Prussiate, ℔ lb. 22@ 24
Phosphate, ℔ lb. .04@.05
Stannate, ℔ lb. .06@ 0[illegible]
Tungstate, ℔ lb. .30@.35
Hyposulphite, ℔ cwt., in casks $1.70 $1.80
Strontium—Nitrate, ℔ lb. .[illegible]@.[illegible]
Sulphur—Roll, ℔ lb. .01¼@.0 ¼
Flour ℔ lb. .01¾@.02
Sylvinit, 27@35%, S.O.P., per unit, 3.75

Talc—Ground French, ℔ ton .01¼@.01¼
American No. 1, ℔ lb. .01¼@.01¼
American No 2 .00[illegible]
Terra Alba—French, ℔ lb. .65@.80
English, ℔ lb. .6[illegible]@.80
American, No. 1, ℔ lb. .6[illegible]@.80
American, No. 2, ℔ lb. .40@.60
Tin—Crystals, in kegs or bbls. .14@.15
feathered or flossed. .20
Muriate, single .07@.12
Double or strong, 54° B. .10@.15
Oxymur, or nitro. .19
Vermillion—Imp. English, ℔ lb. .80
Am. quicksilver, bulk .57 @.59
Am. quicksilver, bags .58 @ .60
Chinese .85 @$1.00
Trieste .90 @ .95
American .11½@ 12
Zinc White—Am., Dry, ℔ lb 04½@.06
Antwerp, Red Seal, ℔ lb. 0[illegible]@.07
Paris, Red Seal, ℔ lb. .07½@.08
Muriate solution .06
Sulphate crystals, in bbls., ℔ lb 03@.03¼

THE RARER METALS.

Aluminum—℔ lb. .80@.85
Arsenic—(Metallic), per lb. .40
Barium—(Metallic), per gram. $4 00
Bismuth—(Metallic), per lb. $2.00
Cadmium—(Metallic), per lb. $1@$1.50
Calcium—(Metallic), per gram. $10.00
Cerium—(Metallic) per gram. $7.50
Chromium—(Metallic), per gram. $1.00
Cobalt—(Metallic), per lb. $6.00
Didymium—(Metallic), per gram. $9.00
Erbium—(Metallic), per gram. $7.50
Gallium—(Metallic), per gram. $140.00
Glucinum—(Metallic), per gram. $12.00
Indium—(Metallic), per gram. $9.00
Iridium—(Fused), per oz. $12.00
Lanthanum—(Metallic), per gr. $10.00
Lithium—(Metallic), per gram. $10.00
Magnesium—(Powdered), per lb. $4.00
Manganese—(Metallic), per lb. $1.10
Chem. pure, per oz. $10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), per gram. $5.00
Osmium—(Metallic), per oz. $65.00
Palladium—(Metallic), per oz. $20.00
Platinum—(Plate), per oz. $11.25
Potassium—(Metallic), per lb. $[illegible].00
Rhodium—(Metallic), per gram. $5.00
Ruthenium—(Metallic), per gm. $5.50
Rubidium—(Metallic), per gram. $2.00
Selenium—(Metallic), per oz. $1.80
Sodium—(Metallic), per lb. .5[illegible]@.75
Strontium—(Metallic), per gm. .80
Tantalum (Metallic), per gram. $9.00
Telurium—(Metallic), per lb. $5.00
Thallium—(Metallic), per gram. .20
Titanium—(Metallic), per gram. $2.25
Thorium—(Metallic), per gram. $17.00
Tungsten—(Metallic), per lb. .8
Uranium—(Oxide), per lb. $5.00
Metallic, per gm. .00
Vanadium—(Metallic), per gram. $22.00
Yttrium—(Metallic), per gram $2.00
Zirconium—(Metallic), per oz. $6.00

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 15.		July 17.		July 18.		July 19.		July 20.		July 21.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.													
Alice, Mont.													
Amador, Cal.													
Atlantic, Mich.													
Belcher, Nev.													
Belle Isle, Nev													
Bodie Cons., Cal.													
Bos. & Mont., Mont													
Breese, Colo.													
Bulwer, Cal.													
Caledonia, S. Dak.													
Catalpa, Colo.													
Chrysolite, Colo.													
Colorado Central, Colo.													
Commonwealth, Nev.													
Comstock T. bonds, Nev.													
" scrip., Nev.													
Cons. Cal. & Va., Nev.													
Crown Point, Nev.													
Deadwood, Dak.													
Enterprise													
Eureka, Cons., Nev.													
Father de Smet, Dak.													
Freeland, Colo.													
Gould & Curry, Nev.													
Grand Prize, Nev.													
Hale & Norcross, Nev.													
Homestake, Dak.													
Horn-Silver, Utah													
Independence, Nev.													
Iron Hill, Dak.													
Iron Silver, Colo.													
Leadville Cons., Colo.													
Little Chief, Colo.													
Martin White, Nev.													
Moulton, Mont													
Mt. Diablo, Nev.													
Navajo, Nev.													
N. Belle Isle, Nev.													
Ontario, Utah	9.00												110
Ophir, Nev.													
Overman, Nev.													
Plymouth, Cal.													
Quicksilver, Pref., Cal.													
" Com., Cal.													
Quincy, Mich.													
Robinson Cons., Colo.													
Savage, Nev.													
Sierra Nevada, Nev.													
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Min. of L. Valley													
Small Hopes, Colo.													
Standard Cons., Cal.													
Yellow Jacket, Nev.													

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 15.		July 17.		July 18.		July 19.		July 20		July 21.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha., Nev.					.20								100
Alta, Nev													
American Flag, Colo.													
Andes, Cal.													
Astoria, Cal.													
Augusta, Ga.													
" bonds.													
Barcelona, Nev													
Belmont, Cal.													
Best & Belcher, Nev.													
Bonanza King, Cal.													
Brunswick, Cal.													
Bullion, Nev.													
Butte & Bost., Mont.													
Castle Creek, Idaho.													
Challar													
Comstock T., Nev.													
Con. Imperial, Nev.													
Con. Pacific, Cal.													
Crescent, Colo.													
Del Monte, Nev.													
El Cristo, Rep. of Col.													
Emmett, Colo													
Exchequer, Nev.													
Independence, Nev.													
Julia, Nev.													
Justice, Nev													
King & Pembroke.													
Lacrosse, Colo.													
Lee Basin, Colo.													
Mexican, Nev.													
Minnesota Iron.													
Monitor, Colo.													
Monte Cristo, Rep. of C.													
Nevada Queen, Nev.													
N. Standard, Cal.													
N. Commonwealth, Nev.													
Overman, Nev.					30								100
Oriental & Miller, Nev.													
Phœnix Lead, Colo.													
Phœnix of Ariz.													
Potosi, Nev.													
Rappahannock, Va.													
S. Sebastian, S. Sal.													
Santiago													
Scorpion, Nev.													
Seg. Belcher, Nev.													
Shoshone, Idaho.													
Silver Hill, Nev.													
Sullivan Con., Dak.													
Sutro Tunnel, Nev.													
Syndicate, Cal.													
Tornado Con., Nev.													
Union Cons., Nev.													
Utah Nev.													

*Ex-dividend. †Dealt in at New York Stock Ex. Unlisted securities. ‡Assessment paid. ¶Assessment unpaid. Dividend shares sold, 110. Non-dividend shares sold, 330. Total shares sold, 310

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	July 14.		July 15.		July 17.		July 18.		July 19.		July 20.		SALES.
Atlantic, Mich.			7.25		7.13				7.13	7.00			270
Bodie, Cal.													
Bonanza Development.													
Bost. & Mont., Mont.	18.13	17.50	18 00	17.50	17.50	16.13	16 53		16 75	16.50	17.00	16 25	5,122
Breese, Colo.													
Calumet & Hecla, Mich.	274	270	271		270		260		259		260		173
Catalpa, Colo.													
Central, Mich.													
Cœur d'Alene, Id													
Con. Cal. & Va., Nev.													
Dunkin, Colo													
Eureka, Nev.													
Franklin, Mich.	10 00	9.25			9.25								88
Honorine, Utah.													
Horn Silver, Utah.													
Kearsarge, Mich.	5 50						5.13						118
Lake Superior, Iron.													
Little Pittsburg, Colo.													
Minnesota Iron, Minn.													
Napa, Cal.													
Ontario, Utah.									9.75				10
Osceola, Mich.	23 25	21.00	24.00	23 38	23 50	22.00	21.50		23.00		23.00		995
Quincy, Mich.					102	100					100	98 00	48
Ridge, Mich.													
Sierra Nevada, Nev.													
Silver King, Ariz.													
Stormont, Utah.													
Tamarack, Mich.	134	133	134		134	130			130		128		218
Tecumseh, Mich.													

NAME OF COMPANY.	July 14.		July 15.		July 17		July 18		July 19.		July 20.		SALES.
Alloues, Mich.													
Arnold, Mich.													
Aztec, Mich.													
Brunswick, Cal.													
Butte & Boston, Mont.	5 50	5.25	5 75		5.75		5 50		5.75	5 50			880
Centennial, Mich.	2.50		2.50	2 38	3 00	2.50	4 13	3.00	3 13	2 25	2 25	1.50	5 215
Colchis, N. Mex													
Copper Falls, Mich.													
Crescent, Colo.													
Dana, Mich.													
Don Enrique, Mex.													
Geyser, Colo.													
Hanover, Mich.													
Humboldt, Mich.													
Hungarian, Mich.													
Huron, Mich.													
Mesnard, Mich.													
National, Mich.													
Native, Mich.													
Oriental & M., Nev.													
Phœnix, Ariz													
Pontiac, Mich													
Rappahannock, Va.													
Santa Fe, N. Mex.													
Shoshone, Idaho.													
South Side, Mich													
Tamarack, Jr., Mich.													
Washington, Mich.													
Wolverine, Mich.	.75				.75								200

Dividend shares sold 7,043 Non-dividend shares sold, 6,295. Total shares sold 13,338.

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last	Dividends. Total paid.	Dividends. Date & amount of last.
1	Ad..., s. L. C.	Colo.	$1,000,000	$10	*		$637.50	Jan..892 05
2	Alaska-Treadwell, g.	Alaska	5,000,000	200,000	25		1,500,000	April 1893 .25
3	...c., s.	Mont.	10,000,000	400,000	25	*	975,000	Nov.. 1891 .06¼
4	Alma & Nel Wood., g	Idaho	300,000	30,000	10	*	60,000	Jan. 1889 .50
5	Amalgamator, g.	Cal.	1,250,000	250,000	5	*	31,250	Aug.. 1890 .12½
6	American, g.	Colo..	3,000,000	300,000	10	*	225,000	Mar.. 1892 .05
7	American Belle, s. g. c.	Colo.	2,000,000	400,000	5	*	50,000	April 1891 .12½
8	Americ'n & Nettie, g. s.	Colo..		300,000			175,000	Mar.. 1892 .05
9	Atlantic, c.	Mich.	1,000,000	40,000	25	280,00	April 1875	$1.00 700,000 Feb.. 1891 1.00
10	Argenta, s.	Nev.	10,000,000	100,000	100	335,00	July.. 1889	.10 40,000 Feb.. 1886 .20
11	Argyle, g.	Colo..	1,000,000	1,000,000	1	*		20,000 Mar. 1892 .01
12	Aspen Mg. & S., s. L.	Colo..	2,000,000	200,000	10	*		780,000 June 1893 .10
13	Aurora, I.	Mich.	2,500,000	100,000	25			650,000 Feb.. 1893 2.00
14	Badger, s	Ont.	250,000	50,000	5			37,500 Mar. 1890 .25
15	Bald Butte	Mont	250,000	250,000	1	*		110,000 July.. 1889 .02
16	Bates Hunter, s. g.	Colo..	1,000,000	1,000,000	1			Dec.. 1891 .00¼
17	Belle Isle, s.	Nev..	10,000,000	100,000	100	220 00	Aug.. 1892	.10 300,000 Dec.. 1879 .25
18	Belcher, s. g.	Nev..	10,000,000	100,000	100	3,16 000	May.. 1892	.25 15,397,000 April 1876 1.00
19	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	1.. 000	Dec.. 1889	.25 200,000 Jan.. 1890 .10
20	Best Friend	Colo.	1,000,000	1,000,000	1			90,000 Feb.. 1892 .01
21	Bi-Metallic, s. G.	Mont.	5,000,000	200,000	25			2,300,000 April 1893 .20
22	Bodie Con., g. i.	Cal..	10,000,000	100,000	100	5: 0,000	June 1890	.25 1,602,572 April 1885 .50
23	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*		520,000 June 1886 .15
24	Boston & Mont., c. s.	Mont.	3,125,000	125,000	25	*		2,075,000 Nov.. 1891 1.00
25	Brooklyn Lead, L. s.	Utah	500,000	50,000	10			127,000 July.. 1885 .05
26	Brotherton, I.	Mich.	2,000,000	80,000	25	*		120,000 Mar.. 1883 .50
27	Bulwer, s.	Cal..	10,000,000	100,000	10	130,000	Aug.. 1889	.25 190,000 Oct.. 1892 .05¾
28	Bunker Hill & S. L.	Idaho	3,000,000	300,000	10	*		150,000 Oct.. 1885 .06
29	Caledonia, g.	Dak..	10,000,000	100,000	100	505,000	May.. 1885	.15 192,000 Oct.. 1890 .08¾
30	Calliope, s.	Colo.	1,000,000	1,000,000				140,000 Jan.. 1891 .00
31	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	1,250,000		39,350,000 May.. 1893 5 00
32	Centen'l-Eureka, s. l.	Utah	1,500,000	30,000	50			675,000 June 1893 .50
33	Central, c.	Mich.	500,000	20,000	25	100,000	Oct.. 1861	.65 1,971,000 Feb.. 1891 1.00
34	Champion, g	Calif.	340,000	34,000	10			132,900 May.. 1893 .10
35	Charysolite, s. L.	Colo..	10,000,000	200,000	50	*		1,500,000 Dec.. 1884 .25
36	Clay County, g	Colo..	200,000	200,000	1	*		56,000 Nov.. 1891 .02
37	Clinton Con, g	Cal..	5,000,000	100,000	5			90,000 Nov.. 1891 .10
38	Cœur D'Alene, s. L.	Idaho	5,000,000	500,000	10			310,000 Nov.. 1891 .02
39	Colorado Central, s. L.	Colo..	2,250,000	225,000	10	*		533,000 April 1893 .05
40	Commonwealth, s.	Nev..	10,000,000	100,000	100	193,000	Sept.. 1892	.10 20,000 Nov.. 1891 .20
41	Confidence, s. L.	Nev.	2,496,000	49,920	100	1,559,550	Aug.. 1892	.50 199,680 April 1885 1.00
42	Cons. Cal. & Va., s. g	Nev..	21,600,000	216,000	100	108,000	Jan.. 1885	.25 3,634,500 Aug. 1891 .50
43	Contention, s.	Ariz..	12,500,000	250,000	50			2,337,500 Aug. 1892 .20
44	Cook's Peak, s.	N. M.	2,000,000	200,000	10			114,432 Nov 1892 .05
45	Cop. Queen Con., c.	Ariz	2,000,000	200,000	10			1 46 1,000 May. 1893 .50
46	Coptis	Nev.	10,000,000	100,000	100			67,000 July.. 1892 .12
47	Cortes, s.	Nev.	1,500,000	300,000	50	*		687,500 Mar.. 1894 .50
48	Crescent, s. L. g.	Utah	11,000,000	600,000	45	60,000	Oct.. 1892	.10 235,000 Oct.. 1888 .03
49	Crown Point, s. s.	Nev..	11,000,000	100,000	100	2,700,000	Sept.. 1892	.25 11,998,000 Jan.. 1871 2.00
50	Cumberland, L. s.	Mont.	5,000,000	500,000	10			15,000 Nov.. 1889 .03
51	Daly, s. L.	Utah	3,000,000	150,000	20			2,850,000 June 1893 .25
52	Deer Creek, s. g.	Idaho	1,000,000	200,000	5	*		20,000 June 1889 .05
53	Deadwood-Terra, g.	Dak..	5,000,000	200,000	25	*		1,150,000 Oct.. 1892 .05
54	Delamar, s. g.	Idaho	2,000,000	400,00	5			80,000 April 1893 .37½

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amt of last
1	Alliance, s. g.	Utah	$100,000	100,000	$1	$125,000 Feb.. 1891 .10
2	Allouez, c.	Mich.	2,000,000	80,000	25	737,500 Jan.. 1890 .70
3	Alpha Con., g. s.	Nev..	3,000,000	30,000	100	300,000 Sept. 1892 .10
4	Alta, s.	Nev..	10,000,000	100,000	100	8,369,880 Jan. 1892 .10
5	American, c.	Idaho	5,000,000	5,000,000	1.00	
6	American Flag, s.	Colo..	1,250,000	125,000	1	300,000 June 1887
7	Amity, s.	Colo..	250,000	25,000	10	
8	Anchor, s. L. g.	Utah	3,000,000	150,000	5	410,000 June 1890 .30
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	125	
10	Appalachian, g.	N. C.	1,750,000	1,400,000	20	
11	Arizona, c	Ariz..	3,575,000	160,000	4	
12	Astoria, s.	Cal..	200,000	100,000	5	
13	Atlanta, g. s	Idaho	3,250,000	650,000	25	
14	Barcelona, s.	Nev..	5,000,000	200,000	5	*
15	Bear Creek	Idaho	100,000	20,000		
16	Belmont, s.	Cal..	500,000	500,000	100	*
17	Belmont, s.	Nev..	5,000,000	50,000	100	735,000 April 1886 .10
18	Best & Belcher, s. g.	Nev..	10,000,000	100,000	10	2,405,275 Aug.. 1892 .25
19	Black Oak, g.	Cal..	3,000,000	300,000	100	*
20	Boston Con., g.	Cal..	10,000,000	100,000	1	170,000 Nov.. 1883 .25
21	Brownlow, g.	Colo..	250,000	250,000	5	
22	Brunswick, g.	Cal..	2,000,000	400,000	2	
23	Buckeye, s. L.	Mont.	1,000,000	500,000	100	
24	Bullion, s. g.	Nev.	10,000,000	100,000	100	2,890,000 Aug. 1892 .25
25	Burlington, g. s.	Cal..	10,000,000	100,000		
26	Butte & Boston, c. s.	Mont.	5,000,000	200,000	10	
27	Butte Queen, g	Cal..	1,000,000	100,000	1	6,000 Jan.. 1892 .04
28	Calaveras, g.	Cal..	500,000	50,000	5	*
29	Calaveras Con., g.	Cal..	800,000	160,000	10	
30	California, s.	Cal..	1,000,000	100,000	5	9,000 Mar.. 1892 .03
31	California Con. L. q.	Cal..	2,250,000	450,000	10	
32	Camsie, g	Ga..	1,500,000	150,000	5	
33	Carisa, s.	Wyo.	500,000	100,000	2	*
34	Cardpano, g. s. L. c.	Penn..	200,000	100,000	2	*
35	Cashier, g. s	Colo..	500,000	250,000	100	*
36	Challenge Con., g. s.	Nev..	5,000,000	50,000	10	
37	Cherokee, g.	Cal..	1,500,000	150,000	100	
38	Chollar, s. g.	Nev..	11,200,000	112,000	2	1,820,000 May.. 1892 .50
39	Cleveland, r.	Dak.	1,000,000	500,000	10	*
40	Colchis, s. g.	N. M.	500,000	150,000	5	*
41	Colorado, s	Colo..	1,625,000	325,000	1	
42	Comstock, s	Utah	1,250,000	250,000	100	
43	Comstock Tun.	Nev..	10,000,000	100,000	100	35,000 Mar.. 1887 .15
44	Con. Imperial, g. s	Nev..	5,000,000	50,000	50	2,062,500 Jan.. 1892 .25
45	Con. New York, g. s	Nev..	5,000,000	100,000	100	110,000 Mar.. 1892 .10
46	Con. Pacific, g.	Cal..	6,000,000	60,000	10	198,000 June 1890 10
47	Con. Silver, s.	Ida..	2,500,000	250,000	5	
48	Cordova Union, g.	Cal..	1,000,000	200,000	10	
49	Crescent, s. L.	Colo.	5,000,000	500,000	100	*
50	Crocker, s	Ariz.	10,000,000	100,000	1	165,000 Aug. 1892 .05
51	Crowell, g	N. C.	500,000	500,000	1	
52	Dahlonega, g.	Ga..	250,000	250,000	10	*
53	Dandy, s	Colo.	5,000,000	500,000		
54	Decatur s	Colo.	1,500,000	300,000		

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total Levied	Assessments. Date and amount of last			Dividends. Total paid.	Dividends. Date & amount of last.		
54	Derbee B. Grav., G.	Col.	10,000 00	00 000	0	100,000	Sept.	1892	.10	60,000	Aug.	1892	.25
56	Dexter, G. &	Nev..	1,000,000	100,000	10	.....	.....	.....	.....	80,000	Aug..	1892	.25
57	Dunkin, S. L....	Colo..	5,000,000	200, 00	25	*	.....	.....	.....	890,000	Oct..	1889	.05
58	Elkhorn, S. L....	Mont	1,000,000	200 00	5	*	.....	.....	.....	1,038,570	June	1893	3½
59	Enterprise, S.	Colo.	2,500,000	5 0,000	5	*	.....	.....	.....	850,000	May	1893	.05
60	Eureka Con., S. L.. G.	Nev...	1,000,000	50,000	100	550,000	June	1889	.50	5,017,500	Jan	1892	.25
61	Evening Star, S. L....	Colo..	500,000	50,000	10	*	.....	.....	.....	1,450,000	Dec..	1889	.2
62	Father de Smet, G...	Dak..	10,000,000	100,000	100	200,000	Nov..	1878	1.00	1,125,000	Dec..	1885	.20
63	Franklin, C..	Mich..	1,000,000	40,000	25	220,000	June	1871	.....	1,100,000	July	1892	2.00
64	Freeland, S. G.....	Colo..	5,000,000	200,000	25	*	.....	.....	.....	190,000	July.	1886	.10
65	Garfield Lt., G. S....	Nev	500,000	100,000	5	.....	.....	.....	.....	90,000	April	1888	.12½
66	Glengarry	Mont.	1,000,000	100,000	10	.....	.....	.....	.....	10,000	June	1891	.10
67	Gold Rock	Colo..	500,000	500,000	1	.....	.....	.....	.....	.....	Dec..	1891	.01
68	Golden Reward. . .	S.Dak	1,250,000	250,000	5	.....	.....	.....	.....	85,000	April	1893	.02
69	Gould & Curry, S. G..	Nev...	10,800,000	108,000	100	4,591,200	June	1892	.25	3,826,800	Oct..	1870	10.00
70	Grand Prize, S.....	Nev...	10,000,000	100,000	100	785,000	Jan..	1890	.30	495,000	Mar.	1894	.25
71	Granite, S. L..... ..	Idaho	500,000	500,000	1	*	.....	.....	.....	83,400	Nov..	1890	.02
72	Granite Mountain, S.	Mont.	10,000,000	400,000	25	.....	.....	.....	.....	12,120,000	July.	1892	.20
73	Great Western, L. Q..	Cal...	5,000,000	50,000	100	.....	.....	.....	.....	444,861	May.	1893	.25
74	Green Mountain, G..	Cal...	1,250,000	125,000	10	*	.....	.....	.....	212,000	Nov.	1881	.07½
75	Hale & Norcross, G. S.	Nev...	11,200,000	112,000	100	5,534,800	Aug.	1892	.50	1,822,000	Aug.	1888	.50
76	Hecla Con., S. G. L. C.	Mont.	1,500,000	90,000	50	.....	.....	.....	.....	1,980,000	Apr	1893	.50
77	Hel'a Mg.& Red,S.L.G	Mont.	3,315,000	663,000	5	*	.....	.....	.....	197,970	July.	1887	.06
78	Helena & Frisco, S.L.	Idaho	2,500,000	500,000	5	.....	.....	.....	.....	170,000	July.	891	.02
79	Helena & Victor... .	Mont.	1,000,000	200,000	5	.....	.....	.....	.....	80,000	May.	1892	.05
80	Holmes, S..... .	Nev..	10,000,000	100,000	100	370,000	May	1890	.25	75,000	Apr.	1886	.25
81	Homestake, G.....	Dak..	12,500,000	125,000	100	200,000	July	1878	1.00	5,003,750	June	1893	.10
82	Honorine, S. L.....	Utah	500,000	250,000	2	37,500	April	1889	.05	125,000	Sept.	1887	.05
83	Hope, S.....	Mont.	1,000,000	100,000	10	*	.....	.....	.....	483,252	July.	1893	.25
84	Horn-Silver, S. L.....	Utah	1,000,000	400,000	25	*	.....	.....	.....	4,700,000	Mar.	1893	.12½
85	Hubert, G.....	Colo..	310,000	3,100	100	.....	.....	.....	.....	247,000	Dec	1889	.00½
86	Idaho, S.....	Cal..	100,000	100,000	1	*	.....	.....	.....	5,454,250	April	1893	2.50
87	Illinois, S..... ..	N. M.	100,000	100,000	1	*	.....	.....	.....	45,000	April	1889	.20
88	Iron Hill, S..... ..	Dak..	2,500,000	250,000	10	134,000	July	1889	.08	156,250	Nov..	188	.07½
89	Iron Mountain, S...	Mont.	5,000,000	500,000	10	*	.....	.....	.....	245,000	July.	893	.08
90	Iron-Silver, S. L....	Colo..	10,000,000	500,000	20	*	.....	.....	.....	2,500,000	April	1893	.20
91	Jack Rabbit, G.....	Cal...	10,000,000	100,000	100	100,000	Sept.	1892	.10	260,000	Aug.	1891	.10
92	Jackson, G. S..... ..	Nev..	5,000,000	50,000	100	237,500	Nov.	1880	.20	60,000	Jan.	1891	.10
93	Kearsarge, C.....	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	80,000	Jan.	189	2.00
94	Kennedy	Cal...	10,000,000	100,000	100	.....	.....	.....	.....	387,000	May..	892	.15
95	Kentuck, S. G.....	Nev..	3,000,000	30,000	100	454,180	Oct.	1891	.15	1,350,000	Dec	1886	.10
96	La Plata, S. L..... ..	Colo..	2,000,000	200,000	10	*	.....	.....	.....	610,000	Sept.	1882	.30
97	Leadville Con., S. L..	Colo..	4,000,000	400,000	10	*	.....	.....	.....	316,500	Feb..	1892	.08
98	Lexington, G. S....	Mont.	4,000,000	40,000	100	*	.....	.....	.....	609,000	Jan..	1891	2.00
99	Little Chief, S. L....	Colo..	10,000,000	200,000	50	*	.....	.....	.....	820,000	Dec..	1890	.05
100	Little Rule, S.....	Colo..	500,000	500,000	1	.....	.....	.....	.....	220,000	Dec..	1891	.02
101	Maid of Erin.....	Colo..	3,000,000	600,000	5	.....	.....	.....	.....	708,500	April	1895	.25
102	Mammoth, S. L. C....	Utah	10,000,000	400,000	250	110,000	.....	1882	.25	1,040,000	Dec...	1891	.10
103	Martin White, S.....	Nev.	10,000,000	100,000	100	1,275,000	Jan..	1892	.25	140,000	Dec..	1886	.25
104	Mary Murphy, S. G...	Colo..	500,000	5,000	100	*	.....	.....	.....	175,000	May..	1888	5.00
105	Matchless, S. L.....	Colo..	300,000	300,000	1	*	.....	.....	.....	15,000	Feb..	1890	.01½
106	Maxfield	Utah	3,000,000	300,000	10	.....	.....	.....	.....	117,000	April	1894	.03
107	Mayflower, D. gravel	Cal..	1,000,000	100,000	10	.....	.....	.....	.....	160,000	July	1893	.10
108	May Mazeppa, S. L..	Colo..	1,000,000	100,000	1	.....	.....	.....	.....	205,000	Oct..	1891	.03½
109	Minas Prietas, G. S..	Mex..	1,000,000	100,000	10	*	.....	.....	.....	350,000	Dec..	1890	.50
110	Minnesota, C.....	Mich..	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar	1876	.....
111	Mollie Gibson, S. ...	Colo.	5,000,000	1,000,000	5	.....	.....	.....	.....	3,680,000	July..	1893	.08
112	Monitor, G.....	S.Dak	2,500,000	250,000	10	.....	.....	.....	.....	45,000	Oct..	1890	.03
113	Mono, G.....	Cal..	5,000,000	50,000	100	760,000	Sept.	1890	.25	12,500	Mar.	1889	.25
114	Montana, Lt., G. S....	Mont.	3,300,000	660,000	5	*	.....	.....	.....	2,619,077	June.	1891	12½
115	Morning Star, S. L..	Colo..	1,000,000	100,000	10	.....	.....	.....	.....	925,000	April	1891	.25
116	Morning Star Drift, G	Cal....	240,000	2,400	100	.....	.....	.....	.....	14,600	April	1893	3.00
117	Moulton, S. G.....	Mont.	2,000,000	400,000	5	*	.....	.....	.....	410,000	Nov.	1892	.07½
118	Mt. Diablo, S.....	Nev..	5,000,000	50,000	100	137,500	June	1880	2.00	210,000	July.	1891	.20
119	Napa, G	Cal..	700,000	100,000	7	.....	.....	.....	.....	580,000	July	1893	.20
120	Navajo, G. S..... ..	Nev..	10,000,000	100,000	100	520,000	May.	1891	.20	229,950	April	1889	.10
121	Newton.....	Cal...	10,000,000	100,000	100	.....	.....	.....	.....	10,00	May..	1891	.05
122	New California, G...	Colo..	800,000	160,000	5	*	.....	.....	.....	48,800	May..	1890	.12½
123	New Guston, S.....	Colo..	550,000	110,000	5	.....	.....	.....	.....	1,877,500	April	1892	.75
124	North Banner Con..	Cal...	1,000,000	100,000	10	.....	.....	.....	.....	20,000	July.	1891	.05
125	North Commonw'th	Nev...	10,000,000	100,000	10	.....	.....	.....	.....	25,000	June.	1891	.25
126	N. Hoover Hill, G. S..	N. C .	300,000	120,00	2½	.....	.....	.....	.....	30,000	Dec..	1885	.06½
127	North Belle Isle, S...	Nev..	10,000,000	100,000	100	474,689	Nov.	1892	.10	230,000	May .	1888	.50
128	North Star, G.....	Cal..	1,000,000	100,000	10	.....	.....	.....	.....	450,000	June	1893	.50
129	Omaha Cons., G.....	Cal...	2,400,000	24,000	100	.....	.....	.....	.....	30,000	May..	1892	.15
130	Ontario, S. L.....	Utah	15,000,000	150,000	100	.....	.....	.....	.....	13,175,000	Oct..	1892	.50
131	Ophir, G. S.....	Nev..	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	Jan..	1888	1.00
132	Original, S. C.....	Mont.	1,500,000	60,000	25	*	.....	.....	.....	138,000	Jan	1889	.05
133	Oro, S. L. G.....	Colo.	500,000	100,000	5	.....	.....	.....	.....	98,000	July.	1890	.20
134	Osceola, C..	Mich..	1,250,000	50,000	25	480,000	April	1876	1.60	1,747,500	May.	1893	1.00
135	Pacific Coast, S.....	Cal...	1,500,000	15,000	100	.....	.....	.....	.....	364,000	Dec.	1892	1.00
136	Parrot, C.....	Mont	1,800,000	180,000	10	.....	.....	.....	.....	1,748,000	April	1893	.10
137	Petro.....	Utah.	10,000,000	10,000	100	.....	.....	.....	.....	17,500	July	1891	.15
138	Plumas Eureka, G..	Cal...	1,406,250	140,625	10	.....	.....	.....	.....	2,668,940	April	1893	.19
139	Plymouth Con., G....	Cal..	5,000,000	100,000	50	*	.....	.....	.....	2,280,000	Feb.	1888	.40
140	Poorman, G. S.....	Idaho	375,000	3,000,000	125	*	.....	.....	.....	68,568	Septl	1892	.....
141	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100	.....	.....	.....	.....	1,925,891	June	1893	1.25
142	" com., Q	Cal...	5,700,000	57,000	100	.....	.....	.....	.....	645,86	July	892	.40
143	Quincy, C.....	Mich.	1,250,000	50,000	25	200,000	Dec..	1862	.....	6,620,000	Aug..	1893	3.06
144	Red Cloud.....	Idaho	1,000,000	200,000	5	*	.....	.....	.....	153,000	Dec	1892	.10
145	Reed National, S. G..	Colo.	500,000	500,000	1	*	.....	.....	.....	50,000	Dec..	188	.01
146	Retriever, L.....	S.Dak	1,250,000	250,000	5	*	.....	.....	.....	20,000	Aug..	1891	.03
147	Rialto, G.....	Colo..	300,000	300,000	1	*	.....	.....	.....	5,250	April	1892	.01½
148	Richmond, S. L.....	Nev.	1,350,000	54,000	25	*	.....	.....	.....	4,346,32	Aug.	1891	.2
149	Rico-Aspen	Colo..	5,000, 0	1,000,000	5	.....	.....	.....	.....	25,00	May.	1886	.02½
150	Ridge, C.....	Mich.	500,000	20,000	25	219,938	Mar	1886	50	99,788	Feb..	889	.50
151	Robinson Con., S. L.	Colo..	10,000,000	200,000	50	*	.....	.....	.....	585,000	Mar	1890	.60
152	Running Lode, G....	Colo..	1,000,000	1,000,000	1	*	.....	.....	.....	36,000	May	1892	.00 1-10
153	Savage, S.....	Nev..	11,200,000	112,000	100	6,772,000	Feb..	1892	.50	4,460,000	June	1865	3.00
154	Sheridan, S. G.....	Colo..	300,000	3,000	100	*	.....	.....	.....	300,000	Oct.,	891	2.50
155	Shoshone, S.....	Idaho	150,000	150,000	1	.....	.....	.....	.....	7,500	April	1888	.01
156	Sierra Buttes, G.....	Cal...	2,225,000	122,500	10	.....	.....	.....	.....	1,544,62	April	893	.12½
157	Sierra Nevada, S. G..	Nev..	10,000,000	100,000	100	6,411,910	June	1892	.25	102,000	Jan..	1871	1.00
158	Sierra Nevada, S. L..	Idaho	1,000,000	1,000,000	1	*	.....	.....	.....	40,000	May..	1889	.02
159	Silent Friend.....	Colo..	500,000	500,000	1	.....	.....	.....	.....	60,000	Aug..	1891	.02½
160	Silver Cord, S. L. G..	Colo..	4,500,000	450,000	10	.....	.....	.....	.....	265,000	April	1888	.10
161	Silver King, S.....	Ariz..	10,000,000	100,000	100	130,000	Nov.	1890	.30	1,950,000	July	1887	.25
162	Silver Mg.Co. L.V.,S.L	N. M	500,000	500,000	1	.....	.....	.....	.....	300,000	Dec..	1891	4.05
163	Silde.....	Colo..	500,000	5,000	100	.....	.....	.....	.....	20,000	Nov.	1891	4.00
164	Small Hopes Con., S.	Colo..	5,000,000	250,000	20	*	.....	.....	.....	32,000	Nov.	1892	.15
165	Spring Valley, G....	Cal..	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan.	88	.25
166	Standard, G. S.....	Cal...	10,000,000	100,000	100	100,000	June	89	.50	3,635,000	July.	1893	.10
167	Stormont, S.....	Utah	500,000	500,000	1	*	.....	.....	.....	155,000	Nov	188	.05
168	St. Joseph, L.....	Mo...	1,500,000	150,000	10	*	.....	.....	.....	1,974,000	Dec..	1891	.02
169	Swansea, G. S.....	Colo..	600,000	60,000	10	.....	.....	.....	.....	27,000	ar.	1893	.10
170	Tamarack, C.....	Mich.	1,250,000	50,000	25	520,000	Apr.	38	3.00	3,160,000	Oct..	1892	.00
171	Teal & Poe.....	N. M.	150,000	150,000	1	.....	.....	.....	.....	9,000	Nov.	1891	.01½
172	Tombstone, G. & L..	Ariz.	12,500,000	500,000	25	*	.....	.....	.....	1,250,000	April	1882	.10
173	Trinity Riv'r Hydr.,G	Colo.	58,000	5,0,000	1	*	.....	.....	.....	10,000	May	1893	.00½
174	United Verde, C....	Ariz.	3,000,000	300,000	10	*	.....	.....	.....	207,500	Jan.	1892	.10
175	Victor, G	Colo.	1,000,000	200,000	5	.....	.....	.....	.....	40,000	June	1895	.05
176	Vista Lt., S.....	Idaho	750,000	150,000	5	.....	.....	.....	.....	337,500	Nov	888	.37½
177	Ward Con., S.....	Colo.	2,000,000	200,000	10	.....	.....	.....	.....	20,000	Dec.	888	.05
178	Woodside, S. L.....	Utah	100,000	100,000	10	.....	.....	.....	.....	25,000	Oct..	888	.25
179	W. Y. O. D.	Cal..	30,000	15,000	4	22,500	May.	1891	.10	58,500	July.	895	.10
180	Yankee Girl, S.....	Colo.	1,300,000	260,00	5	.....	.....	.....	.....	1,405,000	April	189	1.50
181	Yellow Jacket, G. S..	Nev	12,000,000	120,00	10	5,808,000	Sept.	1892	.25	2,184,000	Aug.	87	1.50
182	Yosemite No. 2.....	Utah	1,000,000	100,000	10	.....	.....	.....	.....	25,000	Oct..	1891	.05
183	Young America, G...	Cal...	.....	.....	.....	.....	.....	.....	.....	175,000	Jan..	188	1.00

NON DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Assessments. Date and am't of last.		
55	Denver City, S.....	Colo..	5,000,000	500,00	11	*	.....	.....	.....
56	Denver Gold, G.....	Colo.	60,000	60,000	1	.....	.....	.....	.....
57	Dickens-Custer, S....	Idaho	2,100,000	420,000	5	.....	.....	.....	.....
58	Durango, G.....	Colo..	500,000	500,000	1	*	.....	.....	.....
59	Eastern Dev. Co., Lt	N. S..	1,500,000	150,000	10	990,000	Mar.	1886	1.00
60	El Dorado, G.....	Cal...	1,000,000	250,000	4	*	.....	.....	.....
61	El Talento, G.....	U.S.C.	1,000,000	800,000	2	.....	.....	.....	.....
62	Emma, S	Utah.	625,000	500,000	12	.....	.....	.....	.....
63	Emmons, S. L.....	Colo..	2,000,000	2,000,000	1	.....	.....	.....	.....
64	Empire, S.....	Utah	10,000,000	100,000	100	.....	.....	.....	.....
65	Eureka Tunnel, S. L.	Nev..	10,000,000	100,000	100	*	.....	.....	.....
66	Exchequer, S. G.	Nev...	10,000,000	100,000	100	940,000	Jan..	1892	.25
67	Found Treasure, G. S.	Nev...	10,000,000	100,000	100	130,500	Jan..	1892	.50
68	Gogebic I. Syn., I...	Wis..	5,600,000	200,000	25	.....	.....	.....	.....
69	Gold Bank, G. S.....	Colo.	250,000	250,000	1	*	.....	.....	.....
70	Gold Cup, S.....	Colo..	500,000	500,000	1	*	.....	.....	.....
71	Golden Era, S.....	Mont.	2,000,000	200,000	10	*	.....	.....	.....
72	Gold Flat, G.....	Cal...	1,000,000	100,000	10	5,000	Mar..	1892	.05
73	Gold King, G.....	Colo..	1,650,000	350,000	5	.....	.....	.....	.....
74	Gold Rock, G.....	Cal...	1,000,000	500,000	2	.....	.....	.....	.....
75	Golden FeatherCo., G	Cal...	900,000	180,000	5	.....	.....	.....	.....
76	Goodshaw, G.....	Cal..	10,000,000	100,000	100	*	.....	.....	.....
77	Goodyear G. S. L ...	Mont.	1,000,000	200,000	5	13,000	Feb..	1892	.01
78	Grand Belt, C	Tex..	12,000,000	120,000	100	.....	.....	.....	.....
79	Grand Canyon, S....	Ariz..	375,000	75,000	5	.....	.....	.....	.....
80	Grand Duke, S.....	Colo.	800,000	80,000	10	.....	.....	.....	.....
81	Gregory Con., G.....	Mont.	3,000,000	300,000	10	.....	.....	.....	.....
82	Harlem M. & M. Co., G	Cal...	1,000,000	200,000	5	.....	.....	.....	.....
83	Hartery Con., G.....	Cal...	1,000,000	100,000	10	22,000	Oct..	189	.05
84	Hartshorn, g. s. l.	S.Dak	1,250,000	250,000	5	8,750	Sept.	1891	.00½
85	Head Cent. & Tr., S. G	Ariz.	10,000,000	100,000	100	16,981	Mar..	189	.03
86	Hector, G.....	Cal...	1,500,000	300,000	5	45,000	Jan..	1888	.15
87	Highland, C..... ..	Mich	500,000	25,000	20	.....	.....	.....	.....
88	Himalaya, g. s l....	Utah.	1,800,000	80,000	10	12,800	Oct.	1892	.00½
89	Holywood.....	Cal..	200,000	100,000	2	.....	.....	.....	.....
90	Hortense, S.....	Colo..	2,000,000	200,000	10	.....	.....	.....	.....
91	Huron, C.....	Mich..	400,000	40,000	2	280,000	May.	1887	3.00
92	Idaho, G. S	Idaho	1,250,000	250,000	5	.....	.....	.....	.....
93	Ines, S. L	Idaho	1,000,000	1,000,000	1	.....	.....	.....	.....
94	Ingalls, G	Colo..	100,000	20,000	5	.....	.....	.....	.....
95	Ironton, S.....	Wis.	1,000,000	40,000	25	.....	.....	.....	.....
96	Iroquois, C.....	Mich..	1,250,000	50,000	25	.....	.....	.....	.....
97	Kentuck Con.....	Nev..	10,500,000	105,000	00	57,750	July.	1892	.10
98	J. D. Reymert, S.....	Ariz..	10,000,000	100,000	100	.....	.....	.....	.....
99	Julia Con., G. S....	Nev...	11,000,000	110,000	100	1,463,000	Jan..	1888	.10
100	Justice, G. S. C.....	Colo.	500,000	500,000	1	*	.....	.....	.....
101	Lacrosse, G.....	Colo..	1,000,000	100,000	10	*	.....	.....	.....
102	La Cumbre, G. S....	Mex..	150,000	3,000	50	*	.....	.....	.....
103	Lee Basin, S.....	Colo..	5,000,000	500,000	10	*	.....	.....	.....
104	Little Josephine, S...	Colo..	250,000	50,000	5	.....	.....	.....	.....
105	Lone Star Cons., G..	Cal...	500,000	500,000	1	10,000	April	1892	.00½
106	Lynx Creek, G.....	Ariz..	237,500	147,500	5	*	.....	.....	.....
107	Madeleine, G. S. L...	Colo..	750,000	50,000	1	4,500	Feb.	1892	.00½
108	Mammoth Gold, G...	Ariz..	2,500,000	500,000	5	*	.....	.....	.....
109	Mayflower Gravel, G.	Cal...	1,000,000	100,000	10	*	.....	.....	.....
110	Medora, G.....	Oak..	250,000	250,000	1	585,000	Mar.	189	.50
111	Merrimac Con., G. S	Colo..	5,000,000	500,000	10	.....	.....	.....	.....
112	Mexican, G. S.....	Nev...	10,000,000	100,000	100	2,917,500	ct..	1892	.50
113	Michigan, g s	Mich..	2,500,000	100,000	25	40,000	Mar..	1892	.....
114	Middle Bar, G.....	Cal...	400,000	200,000	2	*	.....	.....	.....
115	Mike & Starr, S. C...	Colo..	1,000,000	200,000	5	*	.....	.....	.....
116	Milwaukee, S.....	Mont.	500,000	500,000	1	.....	.....	.....	.....
117	Minah Cons.....	Mont.	1,250,000	250,000	5	.....	.....	.....	.....
118	Modoc Blue, I. S. g.	Idaho	1,000,000	200,000	5	5,000	Jan..	1892	.00½
119	Monitor, G.....	Colo..	100,000	100,000	1	12,500	May.	189	.01
120	Montreal, G. S. L....	Utah.	750,000	150,000	5	4,500	Feb..	1892	.00½
121	Mountain Ledge, G.	Cal..	500,000	100,000	5	.....	.....	.....	.....
122	Mount McClellan..	Colo.	1,500,000	300,000	5	.....	.....	.....	.....
123	Mutual Mg. & Sm....	Wash.	100,000	100,000	1	*	.....	.....	.....
124	Native, C.....	Mich..	1,000,000	40,000	25	.....	.....	.....	.....
125	Neath, G.....	Colo..	1,000,000	100,000	10	.....	.....	.....	.....
126	Nelson.....	Cal..	50,000	10,000	5	.....	.....	.....	.....
127	Nevada Queen, S.....	Nev..	10,000,000	100,000	100	200,000	Oct..	1889	.25
128	New Germany, G....	N. S.	100,000	100,000	1	*	.....	.....	.....
129	New Gold Hill.....	N. C	1,750,000	350,000	5	.....	.....	.....	.....
130	New Pittsburg, S. L.	Colo..	2,000,000	200,000	10	*	.....	.....	.....
131	New Queen Gold, S..	Colo..	800,000	160,000	5	.....	.....	.....	.....
132	North Standard, G...	Cal...	10,000,000	100,000	100	20,000	Nov	.....	.....
133	Occidental Con., G..	.....	10,000,000	100,000	100	245,000	April	1892	.25
134	Oneida Chief, G.....	Cal...	500,000	125,000	100	*	.....	.....	.....
135	Oriental & Miller, S.	Nev...	10,000,000	400,000	100	.....	.....	.....	.....
136	Original Keystone, S	Nev..	10,000,000	100,000	100	250,000	Mar..	1892	.10
137	Osceola, G.....	Nev...	5,000,000	500,000	10	*	.....	.....	.....
138	Overman, G. S.....	Nev...	11,520,000	115,200	100	4,001,840	May	1892	.10
139	Park, S.....	Utah.	2,000,000	200,000	10	.....	.....	.....	.....
140	Parker, G.....	N. C..	750,000	150,000	.....	.....	.....	.....	.....
141	Pay Rock, S..... ...	Colo..	1,000,000	200,000	5	.....	.....	.....	.....
142	Peer, S.....	Ariz..	10,000,000	100,000	100	190,000	Feb..	1892	.10
143	Peerless, S.....	Ariz..	10,000,000	100,000	100	405,000	Oct..	189	.15
144	Pennsylv'a Cons., G	Cal...	5,150,000	515,000	10	36,050	Feb..	1892	.10
145	Phœnix, g.....	Ariz..	500,000	500,00	1	*	.....	.....	.....
146	Phœnix Lead, S. L.	Colo.	100,000	100,000	1	*	.....	.....	.....
147	Pilgrim, G	Cal...	600,000	200,000	2	*	.....	.....	.....
148	**Pioche M. & R., S. G. L	Utah.	20,000,000	2,000,000	10	.....	.....	.....	.....
149	Poorman, L. S., S. L.	Idaho	250,000	50,000	5	.....	.....	.....	.....
150	Potosi, S.....	Nev..	11,200,000	112,000	100	1,573,000	Mar..	1890	.50
151	Proustite, S.....	Idaho	250,000	250,000	1	*	.....	.....	.....
152	Puritan, S. G.....	Colo..	1,500,000	150,000	10	*	.....	.....	.....
153	Quincy, C.....	Colo.	3,000,000	300,000	10	.....	.....	.....	.....
154	Rainbow, g.....	S. Dak	1,250,000	250,000	5	4,250	July.	1892	.00½
155	Rappahannock, G. S	Va....	250,000	250,000	1	*	.....	.....	.....
156	Red Elephant, S.....	Colo..	500,000	500,000	1	*	.....	.....	.....
157	Red

COAL AND COAL RAILROAD STOCKS.

NAMES OF STOCKS.	July 15. H.	July 15. L.	July 17. H.	July 17. L.	July 18. H.	July 18. L.	July 19. H.	July 19. L.	July 20. H.	July 20. L.	July 21 H.	July 21 L.	Sales.
Am Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Balt. & Ohio	.....	.....	68	.....	66	.....	.....	.....	65½	.....	67¾	66	1,296
do pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buff., R. & P.	.....	.....	30	.....	30	.....	29	.....	.....	.....	.....	.....	360
do. pref	.....	.....	.....	.....	80	.....	28	.....	.....	.....	.....	.....	100
Cambria Iron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & Ohio	15¾	15	15¾	15	15	13¾	14⅜	14⅛	15⅛	14⅜	15¾	14⅞	8,405
do. 1st pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. C. & I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Fuel	22	20	20¾	20	21⅜	21	22	21¾	....	.....	.....	.....	1,735
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col., H. V. & Tol	.....	.....	.....	.....	.....	.....	18⅝	18	18¾	18	18¾	17⅝	1,655
do. pfd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & H. Coal	.....	.....	.....	.....	7¾	.....	.....	.....	.....	.....	7	.....	400
do. pfd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & Hud. C	119	118¾	118	117	115¾	.....	114⅞	113	115	.....	115⅛	114⅜	2,656
Del., L. & West.	144	....	143	141¾	142	139½	140¾	139	142	140⅜	141¼	137⅞	44,879
Hunt. & B. Top	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do pref	.....	.....	50	.....	.....	.....	50	.....	50	49½	.....	.....	250
Lake Erie & West	.....	.....	15⅝	15⅛	15¾	15⅛	15	14¾	15¾	.....	15⅛	15	1,130
do. pref	70¾	.....	70½	.....	69	.....	68⅛	66¾	68	.....	.....	.....	1,990
Lehigh C. & N	.....	.....	49⅝	.....	49⅛	.....	49½	.....	49¼	.....	.....	.....	165
Lehigh Valley	39¾	.....	39¾	39⅝	39⅝	38¾	38⅜	37¾	38	37¾	.....	.....	4,791
Maryland Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	.....	.....	140½	140	.....	.....	.....	.....	141½	141	.....	.....	105
New Cent. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. Central	99⅝	99¼	9 ⅜	98	98	97	97	95	98¾	97	97	.....	5,050
N. Y., L. & W	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., L. E. & W	14¾	14⅜	14⅛	13¾	13	11¾	12¾	13⅛	13¼	13	13⅜	12	39,490
do. pref	.....	.....	30	.....	27	.....	26⅝	.....	28½	27½	27	.....	1,050
N. Y., Susq. & W	12¾	.....	12¼	11⅞	11¾	11¼	12	.....	11¾	11⅜	11⅜	11¼	3,456
do. pref.	55	.....	55	52	.....	.....	.....	.....	.....	.....	.....	.....	620
do. pref., new	.....	.....	42¾	42	41	40¾	40	39¾	41	40	40	39	1,750
N. & West	.....	.....	.....	.....	7¾	.....	.....	.....	.....	.....	.....	.....	50
do. pref	.....	.....	.....	.....	18¾	.....	17¾	16½	16½	.....	.....	.....	634
Penn. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. R. R	50⅜	50	50	49¾	49¾	49¾	49	48¼	49¼	48⅞	.....	.....	8,667
Phil. & Reading	14¾	14¼	14⅛	14¼	14⅜	13	14⅜	13⅜	14⅜	13⅜	14¼	13⅜	38,885
Penn. C. & I	.....	.....	14⅝	13⅜	14⅜	12	13⅜	12⅜	13⅜	12¾	14	13⅜	6,834
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wheel. & L. E	.....	.....	12	.....	.....	.....	11⅜	11	11¾	.....	13	12	1,000
do. pref	43⅞	.....	46	.....	.....	.....	45⅞	41¾	.....	.....	.....	.....	625

Total shares sold, 178,248

INDUSTRIAL AND TRUST STOCKS.

NAME OF STOCKS.	July 15. H.	July 15. L.	July 17. H.	July 17. L.	July 18. H.	July 18. L.	July 19. H.	July 19. L.	July 20. H.	July 20. L.	July 21. H.	July 21. L.	SALES.
Adams Express	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Cotton Oil	31¾	31½	31	30	31	28¾	30	28	30	28	29	28	9,470
do. pref	62	.....	.....	.....	62	55	57	55½	57	56½	57	.....	2,717
Am. Dist. Tel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Express	.....	.....	.....	.....	111	109	109¾	109	.....	.....	.....	.....	203
Am. Sugar Ref	82	80½	80¾	79⅜	79½	75⅛	77	74	77¼	75¼	75¾	73⅛	157,80
do. pref	80¾	.....	80	78⅜	78¾	76	76	74¾	76¾	...	75¾	73¾	5,064
Edison E. Ill. Co	.....	.....	99	.....	.....	.....	99	.....	.....	.....	.....	.....	110
Edison Gen. El	65¼	62¾	63¾	61⅛	61	54½	58	51⅜	5 ¾	48½	50	45	107,354
Nat. Cord. Co	.....	.....	9	.....	.....	.....	9	.....	10	.....	.....	.....	245
do*	.....	.....	14	.....	15	14	.....	.....	14½	.....	.....	.....	820
do. pref	.....	.....	36	.....	36	.....	33	.....	.....	.....	.....	.....	560
Nat. Lead Co	29	28½	28¼	28¼	28	24	25½	24½	26	24½	25⅝	24⅜	10,265
do. pref	65	.....	64½	62½	62	59	60½	58¾	61¾	60	59½	59	5,536
Nat. Lin seed Oil	.....	.....	20½	20	.....	.....	20	19¼	.....	.....	19½	19	720
So. Cotton Oil	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U. S. Express	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.00	1.50	.....
U. S. Rubber	.....	.....	38	.....	37	33½	.....	.....	36	33	34	32½	1,370
do. pref	.....	.....	.....	.....	77	75	.....	.....	71¾	70	.....	.....	590
Wells, Fargo Ex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western Union	79¾	78¾	78¾	77⅛	77⅜	7 ¼	76⅛	74⅜	74¾	76¾	77½	77⅜	93,586

*First assess. paid. Total sales, 396,116.

CALIFORNIA.

San Francisco.

NAMES OF STOCKS.	CLOSING QUOTATIONS. July 14.	July 15	July 17.	July 18.	July 19.	July 20.
Alpha	.....	.....	.....	.....	.....	.....
Alta	.10	.....	.10	.10	.....	.10
Belcher	.35	.....	.40	36.	.....	.35
Belle Isle	.....	.....	.....	.....	.....	.....
B. & Belch	.60	.....	.60	.65	.10	.60
Bodie	.10	.....	.10	.10	.....	.10
Bulwer	.....	.....	.....	.....	.60	.....
Challar	.30	.....	.30	.30	.30	.30
Con. w'ith	.....	.....	.....	.....	.....	.....
Con. C. & V	1.25	.....	1.20	1.15	1.15	1.20
Con. Pac	.....	.....	.....	.....	.....	.....
Crown Pt	1.40	.....	1.40	.35	.35	.35
Del Monte	.....	.....	.....	.....	.....	.....
E'rekaCon	.....	.....	.....	.....	.....	.....
G'ld & C'y	.40	.....	.35	.35	.10	.35
Hale & N	.10	.....	.10	.10	.....	.05
M. White	.....	.....	.....	.....	.40	.....
Mexican	.35	.....	.45	.40	.....	.40
Mono	.....	.....	.....	.....	.....	.05
Mt. Diablo	.....	.....	.....	.....	.....	.....
Navajo	.....	.....	.....	.....	.....	.....
Nev. Qu'n	.....	.....	.....	.....	.....	.....
N. B'lleisle	.....	.....	.....	.....	.....	.....
N. Co'w'th	.....	.....	.....	.....	.....	.....
Ophir	.80	.....	.70	.70	.70	.70
Potosi	.45	.....	.60	.55	.5	.50
Savage	.20	.....	.20	.15	.15	.15
Sierra Nev	.45	.....	.45	.45	.40	.40
Un'n Con	.....	.....	.40	.35	.35	.35
Utah	.....	.....	.....	.10	.10	.10
Yel. Jack	.75	.....	.50	.50	.50	.50

COLORADO.

Aspen. July 1.

	Bid.	Asked
Argentum Juniata	$0.69	$0.70
Aspen Contact	1.10	1.12
Aspen Deep Mining	11	.11½
best Friend	.07½	.08
Bi-Metallic	.07½	.08
Bushwacker	14	.15
Delia S.	1.90	2.00
Gold Valley Placer	.20	.20
Little Annie	.07½	.08
Mollie Gibson	5.50	6.00
Puntine	.09	.09½
Su uggler	35.00	38.00
St. Joe & Mineral Farm	.10½	.11
U. S. Paymaster	....	....

Colorado Springs. July 8.

	Bid.	Asked.
Anaconda Gold	...	.15½
Calumet	...	.03
Cleopatra	...	.09½
Fanny Rawlins	.06	.06½
Gold & Globe	....	...
Gold King	...	...
Isabella	.13½	.14½
Jack Pot	...	...
Jeff Davis	...	...
Lemhi	.80	.95
Matoa	...	...
Ophir	...	..
Orphan Bell	...	...
Pharmacist	.17	.19
Summit M. & M	...	.15
Work	...	.02¾
World	...	.01½

Denver.

Prices and sales for the week ending July 4:

	High.	Low.	Sales.
Anaconda	$.26	$ 21	500
Bangkok-Cora Belle	.02¾	02	....
Diamond B	.03	.02	6,500
Gold Rock	.01½	.03	400
Justice	.01½	.01¼	300
Puzzler	.04	.03	....
Work	.03	.02¾	42,300
Total sales			50,000

MONTANA.

Helena.

Prices for the week ending July 15:

	Bid	Asked.
Bald Butte (Mont.)	$2.25	$2.50
Benton Group (Neihart), Mont.	.12½	.20
Combination (Phillipsb'g), Mont	85	1.00
Cumberland (Castle), Mont	...	....
Elizabeth (Phillipsb'g), Mont	...	.35
Florence (Neihart)	...	....
Helena & Victor, Mont	...	.75
Iron Mountain (Missoula), Mont	.52½	60
Flegan (Marysville), Mont	.25	.50
Flearman (Coeur d Alene), Idaho	.50	.60
Whitlach Union & Macintyre	.30	.40
Yellowstone	...	....

MARYLAND.

Baltimore. July 20.

COMPANY.	Bid.	Asked.
Balt. & N. C	....	$0.04
Conrad Hill	....	...
Cons. Coal	....	.32
Diamond Tunnel	....	.15
George's Creek Coal.	$1.00	1.08
Howard C. & C	1.10	....
Lake Chrome	.01@.02	....
Silver Valley	.03	....

MINNESOTA.

Duluth. July 14.

LISTED STOCKS.

	Par.	Bid.	Asked
Biwabik M. Iron Co	100	$18.00	$19 00
Cincinnati Iron Co	25	.35	.50
Clark Iron Co	100	.40	.60
Cosmopolitan Iron Co	....	....	....
Great Northern Min. Co	100	2 25	2.75
Kanawha Iron Co	100	.20	.30
Keystone Iron Co	....	....	.50
Lake Superior Iron Co	25	1.00	2.00
Lincoln Iron Co	....	....	.50
Little Mesaba Iron Co	100	....	....
Mesaba Moun. Iron Co.	100	10.25	12 00
Minneapolis Iron Co	100	.05	.20
Mountain Iron Co	100	45.00	55.00
Shaw Iron Co	100	.80	1.10
Security Land & Exp. Co.	10	14.00	17 00
Washington Iron Co	100	....	....

UNLISTED STOCKS.

Adams Iron Co		8.00	9.00
Agat Copper Mining Co		....	.30
Allegheny Iron Co	10	....	....
Aurora Iron Co		....	....
Buckeye Iron Co	100	....	2.50
Buffalo Land & Exp. Co		....	.50
Camden Iron Co		....	.25
Chandler Iron Co		....	50.00
Chicago Iron Co	100	.21	.50
Charleston Iron Co	100	.20	.50
Champion Iron Co	100	.20	.40
Cleveland Iron Co		....	....
Columbia Iron Co	100	....	....
Commodore Mining Co		....	....
Comstock Iron Co	100	....	....
Dayton Iron Co	100	....	....
Detroit Iron Co	25	.01	.03
Elmira Land & Iron Co		.10	.25
Great Western Mining Co.	100	.95	1.50
Hall Iron Co		....	....
Homestead Iron Co	25	.00½	.03
Horton Mining Co	10	....	....
Imp. Iron Mt. Mining Co.		....	22.50
Internat'l Development		....	22.50
Kakina Iron Co	25	....	....
Kentucky Iron Co	100	....	....
Lackawanna Iron Co.	100	.45	.60
Macomber Mining Co		....	....
McCaskill Mining Co		.01	.05
McKinley Iron Co	100	....	23.50
Mesaba C., L. & Ex. Co.	10	....	6.00
Mesaba Chief Iron Co	100	2.00	2.50
Mesaba Iron Co		....	.20
Mesaba Mineral Co		....	.75
Minnesota Iron Co		45.00	60.00
Myrna Iron Co	10	....	....
Northern Light Iron Co	100	....	.25
New England Iron Co	100	....	
Ohio Mining Co	100	....	6.00
Oneota Iron Co	100	....	....
Ophir, gold		1.00	1.50
Pennsylvania I. & S. Co.	100	.04	.10
Pioneer		....	1.00
Putnam		....	.80
Rouchleau Iron Co	100	.30	.50
Republic Iron Co.	25	....	.50
Red Hematite Iron Co	100	....	.15
Sheridan Iron Co		....	.20
Standard Ore Co	25	.25	.50
Stowell Iron Co	10	....	....
Towanda Iron Co	100	1.50	2.00
Ver. & Mesaba Iron Co		....	1.00
Zenith Iron Co	25	....	1.25

MISSOURI.

St. Louis. July 19.

Closing quotations:

	Bid.	Asked.
Adams	$0.50	$0.80
American & Nettie, Colo	.30	.35
Bi-Metallic, Mont	....	4.00
Elizabeth, Mont	.25	.30
Granite Mountain, Mont	1.00	....
Hope	1.00	2.75
Leo	...	.05½
Pat Murphy	....	....
Small Hopes	....	.50

PENNSYLVANIA.

Philadelphia. July 20.

(Special report by SAM'L K. DARLING.)

	Bid.	Asked.
Bloomington C. & C	....	....
Buck Mountain C	....	....
Cambria	61@64½	....
Connellsville Gas Co	....	....
Edison E Light Co	115	121
Excelsior B. & S	....	....
Locust Mt. C. & I	....	....
Penn. Salt	...	103½@104
Penn. Steel	....	60
Penn. Gas Coal	47	...
Royal Gas	....	....
Westmoreland C	....	65½@65¾

Pittsburg. July 19.

	Bid.	Asked.
Bridgewater Gas Co	$35.00	....
Carriers Val. Gas	....	$10.00
Con. Gas	45.00	....
Enterprise Mining Co	....	1.50
Hidalgo Mining Co	1.75	....
La Noria Mining Co	8.50	....
Luster Mining Co	8.00	8.50
Manufacturers' Gas	29.00	30 00
N. Y. & Clev. G. C	....	51 00
Ohio Valley Gas	....	32.00
Pennsylvania Gas	9.00	....
Peoples N. G. & P. Co.	13.38	....
Philadelphia Co	18.63	19.00
South Side Gas	....	....
Tuna Oil	....	....
Wheeling Gas Co	....	19.00
W'house Air Brake Co	....	118½

London Quotations.

July 12, 1893.

	Buyer. £ s. d.	Seller. £ s. d.
Alaska Treadwell,		
Alaska Ter	1 15 0	2 0 0
Almada & Tirito, Mex.	3	9
American Relief, Colo.	1 0	1 6
Big Creek, Nev	5 0	10 0
De Lamar, Idaho	15 0	17 6
Elkhorn, Mont	10 6	11 6
Emma, Utah	9	1 0
Flagstaff, Utah	7½	10½
Golden Feather, Cal	11 0	12 0
Golden Gate, Cal	3 6	4 6
Golden Leaf, Mont. & N. M	3	9
Holcomb Valley, Cal.	9	11
Jay Hawk & Lone Pine Mont	6 6	7 6
Maid of Erin, Colo.	2 6	7 6
Mammoth Gold, Ariz.	9	1 0
Mesquital del Oro, Mex, P	3 0 0	4 0 0
Mesquital del Oro, Mex, D	15 0	1 5 0
New Eberhardt, Nev.	.....	3
New Guston Colo.	6 3	8 9
New Montana, Mont.	2 6	3 0
Palmarejo, Mex	6	1 0
Pinos Altos, Mex	1 0	1 6
Poorman Idaho	5 6	6 6
Rajah Gold, Can	6 3	8 9
Richmond Con Nev.	6 3	8 9
Seven Stars, Ariz	1 5 0	1 10 0
Sierra Buttes, Cal	6 0	8 0
" " Plumas Eur., Cal	10 0	12 0
South Poo man, Idaho	1 2 6	1 5 0
Springdale Gold, Colo.	3 0	4 0
United Mexican, Mex.	2 0	3 0
Yankee Girl, Colo	9	1 0

Paris. July 6.

	Francs.
Belmez, Spain	665.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	630.00
Lexington, Mont	82.50
" parts	2 00
Nickel, New Caledonia	735.00
Rio Tinto, Spain	372.50
" " oblig	530.00
" " " 2d	530.00
Tharsis, Spain	118 75
Vieille-Montagne, Belgium	485.00

New York Mining Stocks.

	(Latest quotations.) Bid.	July 21. Asked.
Adams	$0.60	....
Alice	.20	....
Alta	...	...
Amer. Flag	.01	....
Aspen	.20	....
Belcher	.25	....
Best & Belcher	.50	.75
Bodie	.10	....
Breece	....	.50
Brunswick	....	....
Bulwer	.10	....
Caledonia, B. H.	.60	1.00
Carth Creek	....	....
Challar	.30	....
Chrysolite	.15	....
Comstock Tunnel	.06	....
Colo. Central	....	....
Con. C. & Va	1.00	....
Crown Point	....	..
Deadwood	1.00	....
El Cristo	....	.35
Enterprise	....	....
Gould & Curry	.45	.75
Hale & Nor.	.05	....
Horn Silver	2.10	....
Iron Silver	.15	....
Kingston & Pem	....	....
La Crosse	.03	.05
Leadville	.12	....
Little Chief	.16	....
Mexican	.35	....
Mono	....	....
Ophir	.65	....
Phœnix of Ariz	.20	.35
Plymouth	.20	....
Savage	....	....
Sierre Nevada	.40	....
Union	.30	....
Yellow Jacket	.40	..

ASSESSMENTS.

COMPANY.	No.	Dlnqt. in office.	Day of sale.	Amt. per sh're
Alta, Nev	43	Aug. 4	Aug. 25	.15
Best & Belcher	54	July 14	Aug 4	.25
Calumet, S. Dak	1	July 24	Aug. 14	.32
Crocker, Nev	14	July 9	Aug. 3	.05
Crown Pt., Nev	61	July 18	Aug. 8	25
Darboy, S. Dak	3	July 25	Aug. 14	.002
Derbec B. Gravel, Cal	11	July 5	July 27	.05
Exchequer, Nev	36	Aug. 1	Aug. 29	.10
Gold Mt., Cal	5	Aug. 16	Sept. 4	1.50
H'le&Nor., Nev	104	July 25	Aug. 18	.50
Justice, Nev.	54	July 11	Aug. 2	.10
Lady Washington, Nev.	9	Aug. 9	Aug. 30	.10
Occidental, Nev	13	July 26	Aug. 17	.10
Peer, Nev	15	July 9	Aug. 2	.05
Potosi, Nev	38	Aug. 15	Sept 5	.25
RedJacket, Nev	1	July 15	Aug. 5	.05
Savage, Nev	81	July 25	Aug. 14	.25
Silver Hill, Nev	33	June 29	July 28	.05
Utah, Nev	18	July 8	Aug. 5	.10
Weldon, Ariz	7	July 16	Aug. 9	.05
Yosemite No. 2, Utah	....	Aug. 18	Sept. 5	.05

CLASSIFIED LIST OF ADVERTISERS.

Adders and Calculators
Smith, R. C.

Air Compressors and Rock Drills
American Diamond Rock Boring Co.
Bullock, M. C., Mfg. Co.
Burleigh Rock Drill Co.
Clayton Air Compressor Works.
Hasenzahl, W.
Ingersoll-Sergeant Rock Drill Co.
Morris County Machine & Iron Co.
Norwalk Iron Works Co.
Penn Diamond Drill & Mfg. Co.
Rand Drill Co. (See Diamond Drills.)

Aluminum
Cowles Electric, S. & A., Co.

Amalgamators
Bucyrus Steam Shovel & Dredge Co.
Gates Iron Works.

Architects and Builders
Berlin Iron Bridge Co.
Pencoyd Bridge & Const. Co
Pennsylvania Steel Co.
Pollock, Wm. B. & Co.
Scaife, Wm. B. & Son.

Arms and Ammunition
Hartley & Graham.

Asbestos
Leofred A.

Assayers' and Chemists' Supplies

Ainsworth, Wm.	Queen & Co.
Baker & Adamson.	Richards & Co.
Baker & Co.	Roessler & Hasslacher Chemical Co.
Berge, J. & H.	Sargent, A. H., & Co.
Bullock & Crenshaw.	Sneison, W. H., Assay. & Engineering Co.
Denver Fire Clay Co.	Socorro Fire Clay Co.
Greiner, Emil.	Solvay Process Co.
Henry Heil Chem. Co.	Taylor, John, & Co.
Hoskins, Wm.	Troemner, Henry.
Overbrook Chem. Co.	Voland & Van Zelm.
Penn Sm. & Ref. Wks.	
Penna. Salt Mfg. Co.	

Bankers and Brokers

Bandell, E. H.	Hyde, Geo. A.
Bieber & Sohne.	Nevin Commission Co.
Billings, Robt. & Co.	Peabody & Kolff.
Chisolm, A. R., & Co.	Pullman, J. W.
Cochran, A. M.	Smith, C. H.
Gelder, Bailey & Co.	Trenholm, Paul C.
Grant, E. R.	Von Rosenberg, Leo.
Handy & Harman.	

Belting
Hendrie & Bolthoff Mfg. Co.
Jeffery Mfg. Co.
Link Belt Machinery Co.
New York Belting & Packing Co., Ltd.

Blasting Caps and Fuse
Lau, J. H., & Co.
Macbeth, James, & Co.
Metallic Cap Mfg. Co.

Blowers
Sturtevant, B. F. Co.

Boiler Compound
American Fluoride Co.

Boilers

Babcock & Wilcox Co.	Pollock, Wm. B., & Co.
Buckeye Engine Co.	Scaife, Wm. B. & Sons.
Heine Safety Boiler Co.	Star Boiler & Sheet Iron Works.
Lidgerwood Mfg. Co.	Stirling Co.
Orr & Sembower, Inc.	

(See Machinery.)

Brake Shoes
Sargent Co.

Brick Machinery
Freese, E. M., & Co.

Bridges

Berlin Bridge Co.	Penna. Steel Co.
Pencoyd Br. Con. Co.	Scaife, W. B., & Sons.

Buckets

Clark, W. J., & Co.	Scaife, Wm. B. & Sons.

(See Machinery.)

Calculators
Smith, R. C.

Carbons
Bishop, Victor, & Co.

Car Wheels
Whitney, A., & Co.

Chain and Link Belting (See Belting.)

Chemicals

Baker & Adamson.	Penn. Salt Mfg. Co.
Bullock & Crenshaw.	Roessler & Hasslacher Chemical Co.
Henry Heil Chem. Co.	Solvay Process Co.
Overbrook Chem. Co.	Vandenbergh Lab'tory

Coal

Barwind-White Coal Mg. Co.	Maryland Coal Co.
Castner & Curran	Meeker & Co.
Consolidation Coal Co.	Potts, F. A., & Co.
Coxe Bros. & Co.	Stickney, Conyngham & Co.
Haddock, Shonk & Co.	Ward & Olyphant.

Coal Cutters
Ingersoll-Sergeant Drill Co.
Jeffrey Mfg. Co. (See Machinery.)

Coke
Rainey, W. J.

Concentrators, Crushers, Pulverizers, Separators, Etc.
Allis, Ed. P. & Co.
American Ore Machinery Co.
Beckett Foundry & Machine Co.
Blake, Theo. A.
Bradley Fertiliser Co.
Colorado Iron Works.
Copeland & Bacon.
Dimon & Adams.
Fraser & Chalmers.
Frisbee-Lucop Mill Co.
Frue Vanner Concentrator.
Gates Iron Works.
Hendrie & Bolthoff Mfg. Co.
Krom, S. R.
Mechanical Gold Extractor Co.
Pierce & Miller Engineering Co.
Risdon Iron Works.
Sturtevant Mill Co.
Totten & Hogg Foundry Co.
Walburn-Swenson Mfg. Co.
(See Machinery.)

Copper Dealers and Producers

Abbott, Jere., & Co.	Detroit Copper Mg. Co.
American Metal Co.	Lewisohn Bros.
Atlantic Mining Co.	Orford Copper Co.
Baibach S. & Ref. Co.	Osceola Con. Mg. Co.
Baltimore Cop. W'ks.	Penn. Salt Co.
Boston & Col. S. Co.	Phelps, Dodge & Co.
Boston & Mont. M. Co.	Quebrada R. R., L. & C. Co.
Central Mining Co.	Tamarack Mg. Co.
Copper Queen Mg. Co.	
Chicago Cop. Ref'g Co.	

Contractors' and Miners' Supplies
Bucyrus Steam Shovel and Dredge Co.
Carpenter, Geo. B., & Co.
Lidgerwood Mfg. Co.
Pollock, Wm. B., & Co.
Pratt & Whitney Co. (See Machinery.)

Corrugated Iron

Berlin Iron Bridge Co.	Scaife, W. B., & Sons.

Couplings
Lake Co., J. H. & D.

Desks, Chairs, Etc.
Andrews, A. H. & Co.

Diamonds
Bishop, Victor, & Co.

Diamond Drills
American Diamond Rock Boring Co.
Bishop, Victor, & Co.
Bullock Mfg. Co., M. C.
Hasenzahl, W.
Locke & Hasenzahl.
Penn. Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
(See Air Compressors and Rock Drills.)

Drawing Materials

Alteneder, Theo. & Son.	Keuffel & Esser Co.
Heller, Chas. S.	Schwenke, Kirk & Co.

Dredges
Bucyrus Steam Shovel & Dredge Co.
Figee Bros.
Souther & Co.

Dump Cars
Hunt Co., C. W.
Thacher Car & Con. Co.

Dynamos
National Electric Mfg. Co.

Educational Institutions
Corcoran Scientific School.
Harvard Univ. (Lawrence Scientific School)
Michigan Mining School.
Pennsylvania Military College.
State School of Mines.
University of Arizona.
Vanderbilt University.
Woodside Seminary.

Electrical Machinery and Supplies
General Electric Co.
Jeffrey Mfg. Co.
National Electric Mfg. Co.
Okonite Co., Limited.
Thomson-Houston International Co.

Elevators, Conveyors and Hoisting Machines
Brown Hoisting and Convey. Mach. Co
Clark, W. J., & Co.
California Wire Works.
Cooper, Hewitt & Co.
Davis, F. M., Iron Works.
Hunt, C. W., Co.
Jeffrey Manufacturing Co.
Lidgerwood Mfg. Co.
Link-Belt Machinery Co.
Orr & Sembower, Inc.
Scaife, Wm. B. & Sons.
Union Wire Rope Tramway Co.
Vulcan Iron Works.
(See Wire Rope Tramway and Machinery.)

Emery Wheels
New York Belting & Packing Co., Ltd.

Emery Mill Stones
Sturtevant Mill Co.

Employment Bureaus
Engineering Employment Bureau.
Enterprise Employment Agency.

Engineers, Chemists, Metallurgists

Adams, J. N.	Hunt & Robertson.
Adams, W. H.	Jennings, E. P.
Argall, Philip.	Jones & Jones.
Assew & Russell	Kennedy, Julian.
Baker & Co.	Kent, William.
Blandy, John F.	Kerr, Mark B.
Blauvelt, Harrington	Keyes, W. S.
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Boss, M. P.	Ledoux & Co.
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Church, Jno. A.	Osgood, J. O.
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Clement, Victor M.	Penrose & Barringer.
Collins, J. H. & Sons.	Peters, Edward D.
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Endlich, F. M.	Ricketts & Banks.
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Farish, Wm. A.	Rothwell, Richard P.
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Fisk, W. W.	Scheele & Co.
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Froehling, Dr. Henry.	Shapleigh, W.
Fulton, Henry.	Shaw, Thomas.
Furlonge, W. H.	Skewes, Edward.
Furman, R. Van F.	Smith, F. H.
Gerdon, F. A., Jr.	Smith, R. C.
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Hammond, John Hays	Vandenbergh Lab'tory
Hampton, W. Huntley	Van Slooten, Wm.
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Hastings, John B.	Vezin, H. A.
Hedburg E.	Wannemaker, J. F.
Herndon, J. H.	Wills, J. Lainson
Hofman, Ottokar.	Wilson, J. Howard.
Holbaugh, J. R.	Woodman, Durand.
Hollis, H. L. & Co.	Wyatt & Saarbach.
Hooker & Lawrence.	Young & Park.

Engineers' Instruments

Alteneder, T. & Son.	Heller, Chas. S.
Brandis' Sons.	Keuffel & Esser Co.
Bullock & Crenshaw.	Queen & Co.
Everhardt, J. M.	Woolman, G. S.
Gurley, W. & L. E.	

Engines

Barr Pump. Eng. Co.	Orr & Sembower, Inc.
Buckeye Engine Co.	Phil. Eng. Wks., Ltd.
Bullock, M.C., Mfg. Co.	Union Iron Works.
Lidgerwood Mfg. Co.	(See Machinery.)
Morris Co. Mach. & Iron Works.	

Excavators
Bucyrus Steam Shovel & Dredge Co.
Souther & Co.

Fire-Brick and Clay
Chur, A. T.
Denver Fire-Clay Co.

Forges
Foos Mfg. Co.

Furnaces

Hoskins, Wm.	Moore, S. L., & Son Co.
	Pollock, W. P. & Co.

(See Machinery.)

Furniture Office, Etc.
Andrews, A. H. & Co.

Gas Works

Pollock, Wm., B. & Co.	Wood, R. D. & Co.

Gauges, Recording, Etc.

Bristol Mfg. Co.	Everhardt, J. M.

Grease, Graphite, Etc.
Dixon, Jos., Crucible Co.

Hose, Rubber
New York Belting & Packing Co., Ltd.

Hotels

The Cochran.	The Shoreham.
Owen House.	

Inspection and Tests
Hunt, The Robert W. Co.

Insulated Wires and Cables
Crescent Insulated Wire & Cable Co.
Okonite Co., Ltd.

Insurance Companies
Hartford Steam Boiler Inspect'n and Ins. Co.
Mutual Life Insurance Co.

Letters Duplicated
King, Albert B.

Lamps, Miners'
Everhardt, J. M.

Locomotives

Hunt, C. W. Co.	Porter, H. K., & Co.
Thomson-Houston International Co.	

Lubricants
Dixon, Jos., Crucible Co.

Manganese Steel
Taylor Iron & Steel Co.

Mats, Rubber
New York Belting and Packing Co., Ltd.

Machinery.

Dealers in Mining, Milling, Ing and Other Machinery
Acton, John.
Allentown Foundry & Machine Co.
Allis, Edw. P., & Co.
American Ore Machinery Co.
Beckett Foundry & Machine Co.
Bullock, M. C., Mfg. Co.
Carbon Steel Co.
Chicago Iron Works.
Colorado Iron Works.
Contractors' Plant Mfg. Co.
Copeland & Bacon.
Davis, F. M., Iron Works Co.
Dimon & Adams.
Fraser & Chalmers.
Fulton Iron Works.
Griffith & Wedge Co.
Hendrie & Bolthoff Mfg. Co.
Jeffrey Mfg. Co.
Lidgerwood Mfg. Co.
Mechanical Gold Extractor Co.
Mecklenburg Iron Works.
Moore, Samuel L., & Son.
Morris County Mach. & I. Co.
National Electric Mfg. Co.
Oil Well Supply Co.
Orr & Sembower, Incorp.
Penn Diamond Drill & Mfg. Co.
Pierce & Miller Engineering Co.
Pollock, Wm. B., & Co.
Poole, Robt., Son & Co.
Risdon Iron Works.
Scaife, W. B., & Sons.
Sullivan Machinery Co.
Thomson-Houston International Co.
Totten & Hogg Foundry Co.
Trenton Iron Co.
Union Iron Works.
Vulcan Iron Works.
Walburn-Swenson Mfg. Co.
Webster, Camp & Lane Machine Co.

Metal Dealers

Abbott, Jere., & Co.	Eureka Co.
American Metal Co.	Lewisohn Bros.
Am. Zinc-Lead Co.	Mathison Sm'lting Co.
Baker & Co.	Orford Copper Co.
Cookson & Co.	Phelps, Dodge & Co.
Cowles Elec. S. & Aluminum Co.	Picher Lead Co.
	Pullman, J. W.

Metallurgical Works and Ore Purchasers' Processes
American Zinc Lead Co.
Baker & Co
Balbach Smelting & Refining Co.
Baltimore Copper Works.
Boston & Colorado Smelting Co.
Cowles Elect. Smelt. & Aluminum Co.
Hallowell, John K.
Kansas City S. & Ref. Co.
Ledoux & Co.
Mechanical Gold Extractor Co.
Orford Copper Co.
Pennsylvania Salt Mfg. Co.
Ricketts & Banks.
Russell Process Co.
St. Louis Sampling & Testing Works
Walburn-Swenson Mfg. Co.

Mining and Land Companies

Atlantic Mg. Co.	Mollie Gibson Con. Mg. & M. Co.
Boston & Mont. Mg. Co.	Osceola Con. Mg. Co.
Central Mg. Co.	Quebrada R. R. L. & C. Co.
Copper Queen Mg. Co.	Rose Lee Mining Co.
Detroit Copper Mg. Co.	Tamarack Mg. Co.
Eureka Co.	

Oilers, Patent
Powell, Wm., & Co.

Ore Cars
Star Boiler & Sheet Iron Works.
Truax Manufacturing Co.

Ore Sacks
Morrison, T. J.

Ore Testing Works

Hunt & Robertson.	Ricketts & Banks.
Sneison, W. H., Assaying & Engineering Co.	

Packing and Pipe Coverings

Brandt, Randolph.	New York Belting & Packing Co., Ltd.
Jenkins Bros.	Wyckoff & Son, A.
Keasby, Robt.	

Patents
Catlin, Benj. R.

Perforated Metals
Clinton Wire Cloth Co.
Harrington & King Perforating Co.
Mundt & Sons.

Periodicals

Arms and Explosives.	Financial Times.
El Minero Mexicano.	Iron & Coal Trades Review.
Electrical Plant & Electrical Industry.	Indian Engineering.
	Weekly Bulletin.

Phosphates
Trenholm, Paul C.

Phosphor-Bronze
Phosphor-Bronze Smelting Co.

Picks, Miners'
Collins & Co.

Pile Drivers
Lidgerwood Mfg. Co.
Bucyrus Steam Shovel and Dredge Co.

Pipes

Drummond, M. J.	Wyckoff & Sons, A.
Pollock, Wm. B., & Co.	

Platinum
Baker & Co.

Powder

Ætna Powder Co.	Laflin & Rand P. Co.
Atlantic Dynamite Co.	Macbeth, J., & Co.

Printers
King, Albert B.

Pumps

Barr Pump. Eng. Co.	McGowan, John H., & Co.
Blake, Geo. F., Mfg. Co	Morris Co. Mach. & I Co.
Boston & Lockport Block Co.	Pulsometer Steam Pump Co.
Cameron, A. S., Steam Pump Works.	Stillwell - Bierce Smith-Vaile Co.
Jeanesville Iron Wks.	Worthington, Henry.
Knowles Steam Pump Works.	
Maslin & Son, John.	

Publications

Allison Coupon Co.	Financial Times.
Arms & Explosives.	Ir'n & Coal Trades Rev
Electrical Plant & Electrical Industry	Patentable Inventions
	Weekly Bulletin.

Pyrites
Adams, W. H.

Quarrying Machines
American Diamond Rock Boring
Ingersoll-Sergeant Rock Drill Co.
Rand Drill Co.
Steam Stone Cutter Co.
Sullivan Machinery Co.
Union Wire Rope Tramway Co.

Quicksilver
Eureka Co

Railroad Supplies and Equipment

Carpenter, Geo. B., & Co.	Porter, H. K., & Co.
Hunt, C. W., Co.	Robinson & Orr.

(See Machinery.)

Recording Gauges Edson, Jarvis B.

Refrigerating Machines
De la Vergne Ref. Machine Co.

Regulators, Damper, Heat, Etc.

Acton, John.	Mason Regulator Co.
Eddy Valve Co.	Powell, Wm., & Co.

Rock Drills. (See Air Compressor.)

Roofing

Berlin Iron Bridge Co.	Penna. Steel Co.
Lee Composite Co.	Phelps, Dodge & Co.
Pencoyd Bridge and Const. Co.	Scaife, Wm B., & Sons.

Rubber Goods
New York Belting & Packing Co., Ltd.

Sacks, Ore
Morrison, T. J.

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Cinton Wire Cloth Co.
Harrington & King Perforating Co.
Mundt & Sons.
Tyler W. S., Wire Works Co.
(See Machinery.)

Screen Plates
Harrington & King Perforating Co.

Separators
Harrison Safety Boiler Works.

Shaft Sinking
Poetsch-Sooysmith Freezing Co.

Shoes and Dies

Chrome Steel Works.	Reliance Steel Co.
Crescent Steel Co.	Sargent Co.
Pratt & Letchworth.	

Shovels (Steam)
Bucyrus Steam Shovel & Dredge Co.
Souther & Co.

Smelting and Refining Works

Balbach S. & Ref. Co.	Orford Copper Co.
Baltimore Cop'r Wks.	Penn Lead Co.
Bos. & Colo. Smelt. Co.	Penna. Salt Mfg. Co.
Cookson & Co.	Penn Smelting and Refining Works.
Cowles Smelt & Alu. Co.	Phosphor-Bronze Smelt. Co.
Kansas City S. & Ref Co.	
Mathison Smelting Co.	

Steel Rails, Castings, Drill Steel

Abbott, Jere., & Co.	Moore, S. L., & Sons Co.
Allentown Fdy. & Mach. Co.	Pennsylvania Steel Co.
	Pratt & Letchworth.
Bethlehem Iron Co.	Reliance Steel Co.
Billings & Spencer Co.	Roberts, A. & P., & Co.
Carbon Steel Co.	Robinson & Orr.
Chester Steel Cast. Co.	Sargent Co.
Chrome Steel Works.	Whitney, A., & Sons.
Crescent Steel Co.	(See Metal Dealers

Surgical Instruments
Sargent, A. H. & Co.

Tanks
Pollock, Wm. B. & Co.
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Star Boiler & Sheet Iron Works.
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